Underground Structure and Facility Sampling Report

Con Edison Flush Truck Operations

NYSDEC Administrative
Order on Consent
No. R2-0185-93-09

Prepared By

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June, 1995

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Executive Summary

Background

Consolidated Edison Company of New York, Inc. (Con Edison) operates four flush truck facilities in New York City that are collection and transfer points for water and solids removed from underground electric transmission and distribution systems. The facilities are located in Manhattan, Brooklyn, the Bronx, and Queens. A fifth facility in College Point, Queens is no longer in use and not considered as part of this study. Continuous removal of water and solids from the underground structures is essential to uninterrupted delivery of electricity throughout Con Edison's service territory, which encompasses all five boroughs of the City of New York (City) and most of Westchester County.

Flush trucks and vactor trucks remove solids and water from underground structures and transport them to the flush truck facilities. When a flush or vactor truck arrives at a flush truck facility, water in the truck is decanted into the facility's sedimentation basin, where solids settle before the water is discharged to the New York City sewer system. Solid waste is generated when the solids from the trucks are unloaded onto the concrete floor of the facility's drying bin. Currently, solids unloaded at the flush truck facilities are stored in piles and allowed to dewater and dry out by natural means. The solids are then disposed of at offsite disposal facilities.

In 1992, sampling at the flush truck facilities indicated that some solids exceeded the hazardous waste limit for lead when analyzed using the toxicity characteristic leaching procedure (TCLP). Con Edison began disposing of solids that failed TCLP as hazardous waste (D008). Some samples of solids collected at the flush truck facility in Brooklyn also contained asbestos in excess of 1 percent by weight, thus qualifying as asbestos-containing material (ACM). Con Edison entered into Administrative Order on Consent R2-0185-93-09 with the New York State Department of Environmental Conservation (NYSDEC) bring its flush truck operations and facilities into compliance with hazardous waste regulations. As part of the Consent Order, the work plan detailing Phase I (Further Investigations and Data Collection) and Phase II (Feasibility Study) was developed and implemented by CH2M HILL, on behalf of Con Edison, and was approved prior to implementation by NYSDEC on May 9, 1994. Phase I is composed of two tasks: Task 1–Regulatory Review and Analysis, and Task 2–Data Collection and Evaluation. The data collection and evaluation task is divided into two components: 1) determining the quality of the water discharged from the flush truck facilities to the City sewer system, and 2) investigating potential sources of contamination in the underground structures. Information from the evaluation will be used in the feasibility study.

This report summarizes the results of the second, or underground structure, component of the data collection and evaluation task. A separate report titled *Sewer Discharge Report* (CH2M HILL, January 1995) summarizes the results of the first component.

Objectives

The solid phase and liquid phase in underground structures were sampled in place in an effort to identify potential sources of the lead and asbestos found in flush truck solids and to determine whether there is any correlation between the contamination and types of structures, geographical areas, or operational variables.

The underground structure sampling specified in the work plan was performed in 1994. On the basis of the obtained data, opportunities to minimize generation of hazardous waste through waste segregation were identified. Additional underground structures were sampled in 1995 to better evaluate the opportunities to minimize hazardous waste generation.

Analysis of samples taken from the underground structures in 1994 and 1995 is discussed in detail in this report. Samples were evaluated in relation to New York State hazardous waste regulations (6 NYCRR Part 371), the New York City Department of Environmental Protection's (NYCDEP's) sewer-use limits (15 RCNY Chapter 19), and asbestos management regulations. The sampling program, results, and the recommendation for waste segregation are summarized below.

Sampling Program

In accordance with the NYSDEC-approved work plan, CH2M HILL's field team accompanied flush trucks and vactor trucks servicing structures in Queens, Brooklyn, Manhattan, and the Bronx during the 1994 sampling. At every structure, the liquid phase and solid phase were sampled, if present, and street sweep samples were also collected. In addition, any water that overflowed from a flush truck or a vactor truck was sampled. A composite sample of the solids from each truck also was collected at the end of each day. The samples were analyzed for the following parameters:

- Liquid phase and overflow water from trucks:
  - Total lead
  - Total cadmium
  - Total copper
  - TCLP lead
  - TCLP cadmium
  - Total petroleum hydrocarbons (TPHs)
  - Polychlorinated biphenyls (PCBs)
  - Total suspended solids (TSSs)

- Solid phase, truck solids, and street sweep samples:
  - Total lead
  - TCLP lead
  - TPHs
  - PCBs
  - Asbestos

In 1995, an additional 200 solid-phase samples were collected from underground structures in Westchester, Staten Island, Queens, Brooklyn, Manhattan, and the Bronx. These samples were analyzed for TCLP lead. Two additional street sweep samples were collected near structures that were located close to major bridges to further investigate potential environmental sources of lead. The street sweep samples also were analyzed to TCLP lead.

Results and Conclusions

Liquid Phase and Overflow Water

The field observations and collected data yielded the following results and general conclusions:

- All liquid-phase and overflow samples were characterized as nonhazardous.
- Some samples of the liquid phase and overflow water contained concentrations of copper, lead, TPH, and PCBs that exceed City's the sewer-use limits.
- While a correlation could be drawn between concentrations of lead in the liquid phase and the presence of lead-jacketed cable within the structure, no direct correlations could be drawn between concentrations of copper, TPH, and PCBs in the liquid phase and any environmental, operational, or structural factors. The presence of copper in the liquids may be due to the presence of copper cable in the underground structure.
- Overflows from trucks occurred when the trucks were cleaning manholes or transformer vaults. These structures are much larger than service boxes, and the liquid phase in these structures was found to have lower concentrations of solids and metals than the liquid phase in service boxes. According to the analytical results, the standing liquid phase in manholes and transformer vaults is of higher quality than the water that overflows from the trucks. Rather than allowing overflows from the trucks to occur, Con Edison now pumps standing liquid directly into the nearest sewer catch basin, thus improving the overall quality of water discharged into the City sewer system.

Solid Phase and Truck Solids

The following results and conclusions pertain to the solid phase and truck solids:

- None of the solid-phase or truck solids samples qualified as ACM (i.e., none were more than 1 percent asbestos by weight).
- None of the solid-phase or truck solids samples were identified as PCB-contaminated material (i.e., none had concentrations higher than 50 mg/kg).
- The solids that were hazardous only exceeded the TCLP limit for lead.

- Lead in solids collected from underground structures correlated primarily to structural and operational factors rather than to environmental factors.

- Solid-phase samples that were nonhazardous correlated to both geographical location and type of structure.

Con Edison's system has three basic types of underground structures: 1) ***service boxes***, which provide access to customer service cables; 2) ***manholes*** which provide access to primary and secondary cables; and 3) ***transformer vaults***, which provide access to transformers. Table ES-1 summarizes the analytical results by type of structure for TCLP lead in solid-phase material.

Table ES-1
Summary of TCLP Lead Results by Structure Type

Structure Type	Number Sampled	Number Below 5 mg/L Limit	Percentage Below 5 mg/L Limit
Service Boxes	93	84	90%
Manholes	47	27	57%
Transformer Vaults	93	90	97%

Table ES-2 shows the TCLP lead results by geographical location and structure type. TCLP lead data for each structure type within each location also were evaluated statistically. This analysis indicated that the average TCLP lead concentration in the following structures and areas would have a high probability of being below the TCLP regulatory level:

- Service boxes in Brooklyn, Queens, Westchester, Staten Island, and the Bronx
- Transformer vaults in all districts

On the basis of these results, the solid-phase material taken from these structures would be segregated from other solid-phase material, when feasible. Seventy-four percent of the Manhattan service boxes contained solid material that did not exceed the TCLP lead limit. While this is somewhat less than the percentages in other districts (e.g., 94% in Queens), this material also may be segregated. Although the solid phase from these structures will generally not exceed the regulatory limit for TCLP lead, a segregation and confirmatory evaluation program will be developed during Phase III (Final Design).

Table ES-2
Summary of TCLP Lead Results by Location and Structure Type

District	Structure Type	Number Sampled	Number Below 5 mg/L Limit	Percentage Below 5 mg/L Limit
Staten Island	Service Boxes	8	7	87%
	Manholes	9	7	78%
	Transformer Vaults	10	10	100%
Westchester	Service Boxes	6	6	100%
	Manholes	6	3	50%
	Transformer Vaults	6	5	83%
Queens	Service Boxes	16	15	94%
	Manholes	18	9	50%
	Transformer Vaults	22	21	95%
Brooklyn	Service Boxes	24	23	96%
	Manholes	6	3	50%
	Transformer Vaults	21	20	95%
Manhattan	Service Boxes	19	14	74%
	Manholes	3	3	100%
	Transformer Vaults	16	16	100%
Bronx	Service Boxes	20	19	95%
	Manholes	5	2	40%
	Transformer Vaults	18	18	100%
	TOTALS	***233***	***201***	***86%***

Section 1

Introduction

1.1 Background

Consolidated Edison Company of New York, Inc. (Con Edison) has entered into an Administrative Order on Consent R2-0185-93-09 with the New York State Department of Environmental Conservation (NYSDEC) to bring its flush truck operations and facilities into compliance with hazardous waste regulations. As part of the Consent Order, a work plan detailing Phase I (Further Investigations and Data Collection) and Phase II (Feasibility Study) was developed and implemented by CH2M HILL on behalf of Con Edison, and was approved prior to implementation by the NYSDEC on May 9, 1994.

Phase I includes two tasks: Task 1–Regulatory Review and Analysis, and Task 2–Data Collection and Evaluation. Task 2 was further divided into two components: 1) determining the quality of the water discharged to the City sewer from the flush truck facilities, and 2) investigating potential sources of contamination in underground structures. This report focuses on the underground structure component of the data collection and evaluation task. The purpose of the sampling was to identify potential sources of the lead and asbestos contamination found in the flush truck solids and to determine whether the contamination could be correlated with the structure types, geographic areas, or operational factors.

As part of the Underground Structure and Facility Sampling program, underground structures were sampled in four services areas during 1994: Queens, Brooklyn, Manhattan, and the Bronx. Solids located in the structures are referred to in this report as "solid phase." The solids collected from the structures and unloaded at the flush truck facilities are referred to as "truck solids." Standing water in the structures is referred to in this report as "liquid phase." Additional samples of solid phase from underground structures were collected in 1995 to supplement data and to support conclusions regarding waste minimization.

The remainder of this document is presented as follows. Section 2 discusses the regulatory requirements that establish relevant numerical limits on the solids and water generated by structure flushing activities. Section 3 provides a detailed description of the field implementation of the sampling program. Section 4 presents a summary of the environmental, structural, and operational variables associated with the structures that were sampled in 1994. Section 5 summarizes the analytical results, and Section 6 presents an analysis of the data, including conclusions on sources of contamination and relationships with environmental, structural, and operational variables. Analytical results of the solid-phase sampling performed in 1995, and conclusions regarding waste minimization on the basis of the 1994 and 1995 sampling are discussed in Section 7.

A brief description of the underground system and the flush truck process is presented below.

1.2 Underground System

Con Edison operates an extensive underground electric transmission and distribution system. The system includes a large number of structures that provide access to various electrical equipment contained within the underground structures. The structures include manholes that contain transmission or primary and secondary electrical cables, or both; service boxes that contain low-voltage secondary mains and service cables; and vaults that contain network transformers and primary and secondary cables. Examples of structures and cable types in the system are presented in Figure 1-1. In this report, the different types of structures are referred to either specifically by type or more generally as "structures."

There are more than 275,000 underground structures within the Con Edison system. The structures are located throughout the Con Edison service territory, which encompasses the five boroughs of the City of New York and most of Westchester County. Table 1-1 summarizes the approximate number of structures by district. Queens, Brooklyn, and Manhattan each contain approximately one-quarter of the underground structures in Con Edison's system.

1.3 Flush Truck Process

During stormwater runoff events, various street solids are carried into the structures through openings in covers and gratings, and fine soil and silt particles can enter the structures through cable ducts that are not watertight. In addition, structures in areas of high water table may be flooded permanently with groundwater. In other areas, structures may contain water temporarily, during and after intensive rainfalls. Before scheduled maintenance and emergency repairs of electrical equipment in underground structures, solids, oil, and water (if present) must be removed. If a structure is flooded with groundwater, continuous pumping may be necessary during maintenance or repair work in the structure. All of these scenarios were observed during the sampling program.

Con Edison uses flush trucks and vactor trucks to clean the structures. The tank of each flush truck has three settling compartments and a fine-mesh screen and is partially filled with city water before the truck is dispatched to the field. The water in the flush truck is pumped under pressure into a structure where solids are suspended. The mixture of water and solids is recirculated into the compartmented tanks for settling the solids and reinjecting the water into the structure. In this way, a flush truck may clean 5 to 10 structures before its holding capacity is reached. Vactor trucks primarily use a vacuum system rather than water to remove solids from structures. Each vactor truck is equipped with a smaller secondary tank that contains water. Solids are vacuumed into the main tank of the vactor truck After most of the solids have been vacuumed from a manhole, a relatively small amount of water from the secondary tank is used to flush and rinse the structure. The rinse water, which contains fine solids, also is vacuumed into the main tank of the vactor truck.

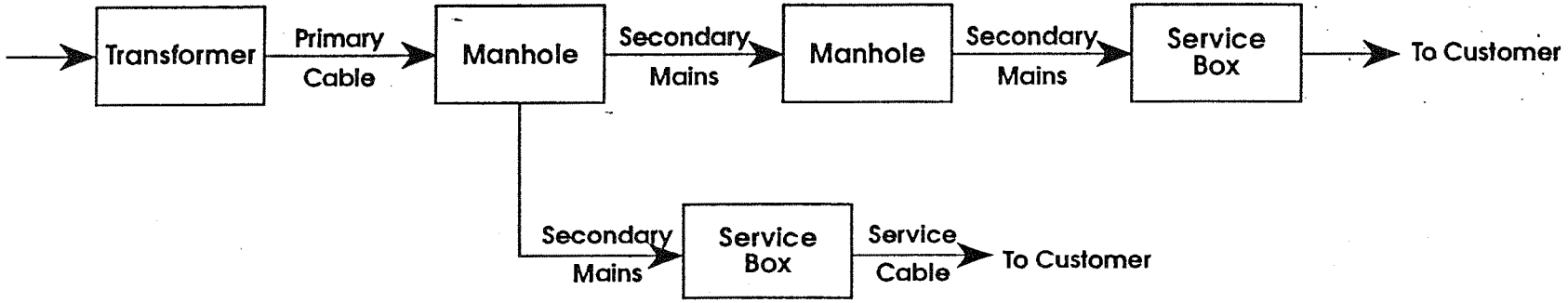

Figure 1-1
EXAMPLE OF UNDERGOUND SYSTEM CONNECTIONS

Table 1-1
Summary of Underground Structures[a]

District	Manholes	Services Boxes	Transformers	Miscellaneous	Total Number of Underground Structures by Area	Percentage of Underground Structures by Area
Queens	19,482	60,376	5,114	—	84,972	31
Brooklyn	21,848	48,630	5,700	—	76,178	27
Manhattan	58,658[b]	—	8,657	—	67,315	24
Bronx	8,061	18,457	2,694	—	29,212	10
Staten Island	1,200	4,500	130	2,400	8,230	3
Westchester	4,895	3,939	2,444	1,348	12,626	5
TOTAL	114,144	135,902	24,739	3,748	278,533	100

[a]Information presented in this table is from Appendix D1 of the Con Edison report prepared by the Flush Assessment Team dated March 1995.
[b]Includes service boxes

If a structure contained a large volume of water that exceeded the flush or vactor truck's storage capacity, the previous practice was to release the excess water from the trucks into the nearest catch basin of the City sewer system during the cleaning operation. Recently, Con Edison has instituted a policy prohibiting such overflows.

If groundwater flows continuously into a structure after the initial cleanup is completed, portable pumps are used by electrical crews to maintain a low water level within the structure so that the required maintenance or repair operations can be completed. The water removed by the portable pumps is directed from the structure into the nearest sewer or catch basin.

Solids collected from the structures are transported by flush trucks and vactor trucks to the flush truck facilities for appropriate management. The Farrington Street facility stores solids that have been removed from structures in Queens; the Third Avenue Yard facility stores solids removed from structures in Brooklyn and Staten Island; and the West 28th Street facility stores solids removed from structures in Manhattan. Solids removed from structures in the Bronx and Westchester are stored at the Hell Gate facility. The College Point facility is used infrequently and was not included in this evaluation, according to the approved work plan. The approximate locations of the four facilities are shown in Figure 1-2.

When a flush truck arrives at a flush truck facility, the excess water in the truck is decanted and flows into the facility's sedimentation basins. The flush truck process generates solid waste when the wet solids are unloaded onto the concrete floor of the drying bin. The solids that have accumulated in the vactor truck's main tank are unloaded directly onto the concrete floor of the facility's drying bin. The truck solids deposited at the flush truck facilities are stored in piles and allowed to dewater and dry out by natural means. The solids unloaded at the facilities were sampled as described in Section 3. Decanted water and sewer discharge also were sampled and analyzed as described in the *Sewer Discharge Report* (CH2M HILL, January 1995).

Figure 1-2
LOCATIONS OF CON EDISON FLUSH TRUCK FACILITIES

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Section 2

Regulatory Requirements

The regulations used for comparative purposes in evaluating the solids collected from underground structures and the liquids discharged from flush trucks are the New York State hazardous waste regulations (6 NYCRR Part 371), the City Sewer Regulations (Chapter 19: "Use of the Public Sewers, Including Sewer Surcharges"), and the New York City Department of Environmental Protection (NYCDEP) "Asbestos Control Program Rules and Regulations" (Local Law, Title 15).

2.1 Hazardous Waste Regulations

Procedures for identifying hazardous waste are codified in 6 NYCRR Part 371. Waste is evaluated for the toxicity characteristic in accordance with the Method 1311 toxicity characteristic leaching procedure (TCLP).

Parameters and regulatory levels that are applicable to flush truck operations and that were evaluated using the TCLP are listed in Table 2-1. Samples of the solid phase collected from underground structures, solids unloaded from trucks, and overflow discharged to the City sewer system were subjected to the TCLP for lead. Because cadmium was detected using the TCLP in previous investigations (although well below the regulatory level of 1 milligram per liter [mg/L]), samples of overflow from trucks were analyzed for cadmium using the TCLP.

Table 2-1
Maximum Concentrations of Contaminants for Toxicity Characteristic

Hazardous Waste Number	Parameter	Regulatory Level
D006	Cadmium	1.0 mg/L
D008	Lead	5.0 mg/L

2.2 City Sewer-Use Limits

Parameters and limits applicable to sewer discharges from overflow samples are listed in Table 2-2.

Table 2-2 City Sewer-Use Limits	
Parameter	**Level**
Cadmium	2 mg/L
Copper	5 mg/L
Lead	2 mg/L
Petroleum Hydrocarbons	50 mg/L
Total polychlorinated biphenyls (PCBs)	Nondetectable
pH	5.0 to 11.0 standard units

2.3 Asbestos Regulations

Regulations affecting the management of asbestos are summarized in Table 2-3. In general, to be regulated as asbestos containing material (ACM), solids must be *more* than 1 percent of asbestos by weight.

Table 2-3 Asbestos Regulations	
Program	**Regulatory Threshold**
Federal Toxic Substances	> 1% asbestos by weight
Federal Emissions Standard (NESHAP)	> 1% asbestos by weight
New York State Solid Waste Regulations	> 1% asbestos by weight
New York State Department of Labor	> 1% asbestos by weight
New York City Asbestos Control Program	> 1% asbestos by weight

Section 3

Sampling Program

3.1 Overview

A CH2M HILL sampling team accompanied flush trucks and vactor trucks servicing structures in Queens, Brooklyn, Manhattan, and the Bronx. Table 3-1 lists the sampling sites and dates for each area sampled.

Table 3-1
Sampling Areas

Area Sampled	Sampling Dates	Facility Sampled
Queens	May 26, 27, and 31, 1994	Farrington Street, Queens
Brooklyn	June 1-3, 1994	Third Avenue Yard, Brooklyn
Manhattan	June 8-10, 1994	West 28th Street, Manhattan
Bronx*	July 12, 14, and 15, 1994	West 28th Street, Manhattan

*Typically, solids collected from the Bronx are unloaded at the Hell Gate facility in the Bronx. During the sampling, however, the Hell Gate facility was closed, so the solids were unloaded at the West 28th Street facility.

The sampling team traveled with either one flush truck or one vactor truck per day for 3 typical working days in each area. If present, the liquid phase and solid phase from each structure were sampled. Street sweep samples were collected at each location. If water overflowed from a flush truck or a vactor truck, a sample of the overflow was collected. At the end of the sampling day, the truck decanted the liquid and unloaded the solids at the flush truck facility. A composite sample of the solids from each truck was collected. The decanted water and the resulting sewer discharge also were sampled as described in the *Sewer Discharge Report* (CH2M HILL, January 1995).

Samples were analyzed for all parameters except asbestos by Accutest Laboratory in Dayton, New Jersey. Analysis for asbestos was performed by Northeastern Analytical Corporation in Marlton, New Jersey.

3.2 Sampling Methodology

Descriptions of the sampling methods and the analyses are presented in this section. Field observations and pH and temperature data are presented in Appendix A. The sampling methodology was developed and is presented in the approved work plan dated May 9, 1994. Details of the sampling and deviations from the work plan are discussed below.

3.2.1 Sample Descriptions

Liquid and solids from each structure were sampled, if present. Liquid-phase samples were collected directly from the structure into the sample containers. After the sample was collected, the liquid phase was removed from the structure by the Con Edison flush truck crew until the solid phase was exposed. Solid-phase samples were collected from various areas in the structure using a decontaminated stainless steel trowel and bowl. A hand corer was used to collect samples in structures where there was more than a 1-foot depth of solids. The solid-phase samples were composited and homogenized in a decontaminated stainless steel bowl according to approved standard operating procedures (SOPs).

Street sweep samples were collected at each location using a decontaminated stainless steel trowel and bowl. The sample was homogenized in accordance with procedures described in the SOPs in the approved work plan.

Under Con Edison's previous policy, when the flush or vactor truck cleaned out a structure that contained a volume of water too great to pump into the truck, the excess water was released into the nearest catch basin of the City sewer system. A sample of the overflow water was collected directly into the sample containers. Con Edison's present policy no longer allows overflow from flush trucks or vactor trucks.

3.2.2 Location- and Sample-Identification Numbers

Samples from each structure were given four-digit location-identification numbers: XX-X-X. The code indicates the sample location and the sample sequence. From this information, we can correlate any sample with Con Edison's structure number. The first two digits of the location-identification number correspond to the flush truck facility and the area sampled, as follows:

- FS: Farrington Street, Queens
- BR: Third Avenue Yard, Brooklyn
- MN: West 28th Street, Manhattan
- HG: Hell Gate, Bronx

The second digit is a number from 1 to 3, which corresponds to the day of sample collection. The fourth digit is A, B, C, or D, which denotes the first, second, third, or fourth structure sampled that day. For example, location BR-1-C indicates that this was the third structure sampled during the first day of sampling in Brooklyn.

A six-digit sample-identification number was assigned to distinguish the type of sample collected from each location: XX-XX-X-X. The sample-identification number relates the four types of samples to the structure sampled. The first two digits are FS, BR, MN, or HG, as described above. The third and fourth digits identify the type of sample collected, as follows:

- SP: Solid phase
- LP: Liquid phase

- SS: Street sweep
- OF: Truck overflow water
- TD: Truck solids unloaded at the facility

The fifth digit (1, 2, or 3) corresponds to the day of sampling. The sixth digit (A, B, C, or D) corresponds to the sequence of sampling or indicates that the sample was a duplicate (X). For example, BR-LP-1-C indicates a liquid-phase sample collected from the third structure sampled during the first day of sampling in Brooklyn.

Table 3-2 summarizes the location codes and the types of samples that were collected during the sampling program. Table 3-3 summarizes the analyses performed for each type of sample. Figure 3-1 shows the locations of the structures sampled.

3.3 Sampling Activities

The sampling activities are described by geographic area. In all areas, field survey forms were used to record structural and environmental field observations. The observation data were used to develop structural and environmental profiles and are discussed in Section 4.

3.3.1 Queens

Structures in Queens were sampled on May 26, May 27, and May 31, 1994. A flush truck was used to clean the structures on May 26 and 27; a vactor truck was used on May 31. The trucks originated from the College Point yard. The trucks were cleaned by Con Edison personnel before the sampling each day to minimize potential interference from sources not sampled.

Nine structures were sampled in Queens. Liquid-phase samples were collected from five of the structures. Solid-phase samples and street sweep samples were collected from all nine structures. Two samples of overflow water were collected.

Solids were unloaded from each truck at the end of the day at the Farrington Street facility. A composite sample of the solids was collected each day, for a total of three samples.

3.3.2 Brooklyn

Structures in Brooklyn were sampled from June 1 through June 3, 1994. Con Edison crews used two different vactor trucks and one flush truck to clean out the structures during the sampling. The trucks originated from the Third Avenue Yard where they were cleaned before the sampling each day.

Ten structures were sampled in Brooklyn. Samples of solids and street sweeps were collected from all 10 structures. Liquid-phase samples were collected from 8 of the 10 structures. One sample of overflow water was collected.

Table 3-2
Summary of Underground Structure Sampling Locations

District	Sample Date	Location ID Number	Con Edison ID Number	Type of Structure	Type of Sample Collected				Cleaning of Structure
					Solid Phase	Liquid Phase	Overflow Water	Street Sweep	
Queens	26-May-94	FS-1-A	TM6932	Transformer	X	X		X	Yes
		FS-1-B	VS388	Transformer	X	X		X	Yes
		FS-1-C	VS7608	Transformer	X	X		X	Yes
	27-May-94	FS-2-A	TM6301	Transformer	X	X	X	X	Yes
		FS-2-B	VS7607	Transformer	X			X	Yes
		FS-2-C	M14587	Manhole	X			X	Yes
		FS-2-D	SB1231	Service Box	X	X		X	Yes
	31-May-94	FS-3-A	SB51316	Service Box	X			X	Yes
		FS-3-B	M12243	Manhole	X		X	X	Yes
Brooklyn	1-Jun-94	BR-1-A	M8370	Manhole	X			X	Yes
		BR-1-B	M2461	Manhole	X	X		X	Yes
		BR-1-C	M726	Manhole	X	X		X	Yes
		BR-1-D	M784	Manhole	X			X	Yes
	2-Jun-94	BR-2-A	SB52965	Service Box	X	X		X	Yes
		BR-2-B	SB48297	Service Box	X	X		X	*No*
		BR-2-C	SB48656	Service Box	X	X		X	Yes
		BR-2-D	SB22994	Service Box	X	X		X	Yes
	3-Jun-94	BR-3-A	M4281	Manhole	X	X		X	Yes
		BR-3-B	M4283	Manhole	X	X	X	X	Yes
Manhattan	8-Jun-94	MN-1-A	M9109	Manhole		X		X	*No*
		MN-1-B	SB9458	Service Box	X			X	Yes
		MN-1-C	M33848	Manhole	X	X	X	X	Yes
		MN-1-D	VS3000	Transformer			X	X	Yes
	9-Jun-94	MN-2-A	SB23477	Service Box	X	X		X	Yes
		MN-2-B	SB23478	Service Box		X		X	*No*
		MN-2-C	M25176	Manhole	X	X	X	X	Yes
	10-Jun-94	MN-3-A	V4561	Transformer		X		X	*No*
		MN-3-B	SB30187	Service Box	X	X		X	Yes
		MN-3-C	M24883	Manhole	X	X		X	Yes
Bronx	12-Jul-94	HG-1-A	SB11010	Service Box	X	X		X	Yes
		HG-1-B	M13341	Manhole	X	X	X	X	Yes
		HG-1-C	F7160	Service Box	X			X	Yes
	14-Jul-94	HG-2-A	M1496	Manhole	X	X	X	X	Yes
		HG-2-B	SB15422	Service Box		X		X	Yes
		HG-2-C	SB18976	Service Box	X	X	X	X	Yes
	15-Jul-94	HG-3-A	M23437	Manhole	X	X	X	X	Yes
		HG-3-B	M13521	Manhole	X			X	Yes
		HG-3-C	M3346	Manhole	X			X	Yes

Table 3-3
Underground Structure and Facility Sampling:
Analytical Summary

Parameter	Solid Phase	Liquid Phase	Overflow Water	Street Sweep	Truck Solids
Total Cadmium		X	X		
Total Copper		X	X		
Total Lead	X	X	X	X	X
TCLP[a] Cadmium		X	X		
TCLP Lead	X	X	X	X[b]	X
PCBs[c]	X	X	X		
TPHs[d]	X	X	X	X	X
TSSs[e]/Solids[f]	X	X	X	X	X
Asbestos	X			X	X
pH/Temperature[g]		X	X		

[a]Toxicity Characteristic Leaching Procedure (TCLP)

[b]Street sweep samples were analyzed for TCLP lead only if the corresponding solid-phase TCLP lead concentration had a concentration greater than or equal to 5.0 milligrams per liter

[c]polychlorinated biphenyls

[d]total petroleum hydrocarbons

[e]total suspended solids

[f]Analyses of solids were performed on solid-phase and street sweep samples as part of the TCLP

[g]Field measured, according to the approved work plan

FIGURE 3-1
SAMPLING LOCATIONS

CH2MHILL

EPA-GE-Supp.01-0000235

There were two deviations from the work plan during the sampling:

- Water in location BR-2-C was removed before the vactor truck and the sampling team arrived. Although the liquid phase in the structure was sampled, the overflow had stopped and could not be sampled.

- Although liquid- and solid-phase samples were collected from location BR-2-B, the flush truck crew was called to an emergency cleanup before the structure could be cleaned. Therefore, no liquids nor solids were taken into the truck.

Only two structures were sampled on June 3, 1994, because the screens inside the flush truck were clogged. The truck returned to the facility for maintenance.

Solids were unloaded from each truck at the end of the day at the Third Avenue Yard facility. A composite sample of the solids was collected each day, for a total of three samples of truck solids.

3.3.3 Manhattan

Structures in Manhattan were sampled from June 8 through June 10, 1994. A single flush truck originating from the West 28th Street facility was used on all three sampling days. The truck was cleaned by Con Edison personnel before the sampling each day.

Ten structures were sampled. Solid-phase samples were collected from 6 of the 10 structures. Street sweep samples were collected at all 10 locations. Overflows occurred and were sampled at three locations. Two overflows were directed to catch basins (MN-1-C and MN-2-C), and one was pumped to a sewer manhole (MN-1-C). Liquids from eight structures were sampled.

There were four deviations from the work plan, as described below. The first two were caused by the presence of oil in the manhole, the third was the result of an operational issue, and the fourth was caused by a fire. Oil phase was observed at locations MN-1-A and MN-2-B. Although each structure was sampled, the flush truck followed Con Edison's SOPs and did not collect the solids and liquids in the structures because of the oil. The flush truck operators needed to confirm only the identification number on top of the transformer at location MN-3-A. Therefore, the structure was not cleaned out, although liquid-phase and street sweep samples were collected at this location.

A fire occurred in transformer vault MN-1-C, which prevented the collection of solid-phase and liquid-phase samples. However, samples of overflow water and street sweep samples were collected.

Solids were unloaded from each truck at the end of the day at the West 28th Street facility. A composite sample of the solids was collected each day, for a total of three samples.

3.3.4 The Bronx

Structures in the Bronx were sampled on July 12, July 14, and July 15 of 1994. One flush truck originating from the Bronxdale Avenue facility was used on all three sampling days. During that time, the Bronx district had only two trucks in operation. The Hell Gate facility was closed, so truck solids were unloaded at the West 28th Street facility in Manhattan. Because a limited number of trucks was available, the same truck was used each day; therefore, the truck was not cleaned before the sampling each day in the Bronx.

Nine structures were sampled. Solids from eight of the nine structures were sampled. Liquid-phase samples were collected from six of the nine structures. Street sweep samples were collected from nine locations. Four overflows occurred, were sampled, and pumped to a storm-sewer catch basin at each location.

There was one deviation from the work plan because of a burnout in location HG-3-A. A sample of solid phase was collected from the structure, but the solid phase was not taken into the flush truck for safety reasons.

Solids were unloaded from each truck at the end of each day at the West 28th Street facility. A composite sample of the solids was collected each day, for a total of three samples.

Section 4

Environmental, Operational, and Structural Information

The purpose for sampling underground structures within Con Edison's system was to identify potential sources of the lead and asbestos found in the solid phase during cleanout of the structures and to determine if the contamination could be correlated to environmental, operational, or structural factors. This section presents the environmental, operational, and structural information obtained for the structures sampled in 1994. A field summary sheet was used at each structure to record the structure-identification number, street address, type of structure (manhole, service box, or transformer vault), and environmental, operational, and structural information.

4.1 Environmental Information

Environmental observations made during field investigations included the following:

- Description of the surrounding area (residential, commercial, or industrial)
- Traffic patterns
- Proximity of bridges
- Presence of standing water and infiltration within each structure

Environmental information for each structure is presented in Table 4-1.

4.2 Operational Information

Operational information is presented in Table 4-2. Con Edison staff from each district were asked to identify electrical-maintenance records for the sampled structures. Scheduled maintenance is performed once a year at transformer vaults, but detailed maintenance records were available only for the transformer vaults in Manhattan. Each district maintains databases for repair and maintenance activities performed within manholes, but the information in the databases was of limited use for this study. Repair and maintenance activities performed within service boxes usually are not recorded.

4.3 Structural Information

The following Con Edison records provided structural information, when available, for each structure that was sampled:

- Mains and service plate drawings: These drawings identify the numbers of secondary mains and service cables within a structure. In some cases, the type of insulation (for example, lead versus nonlead) is indicated on the drawings.

Table 4-1
Environmental Information

Area	Location Code	Town/Area	Residential	Commericial	Light Industrial	Industrial	Traffic Flow[a]	Name of Nearby Bridge	Distance to Bridge[b]	Field Observations
Queens	FS-1-A	Ridgewood				X	L			Near municipal recycling yard and Ettco Wire and Cable Co.
	FS-1-B	Jamaica	X	X	X		H	Queens Blvd. over Van Wyck and Main St.	Same block	Heating oil fill nearby on sidewalk.
	FS-1-C	Maspeth	X			X	L			Loading dock at the end of the street.
	FS-2-A	Middle Village	X	X			L			Near Ever Rite Fuel Co.
	FS-2-B	Rego Park	X				L			Railroad tracks one block away.
	FS-2-C	Rego Park	X				L			Railroad tracks one block away.
	FS-2-D	Glendale	X	X			H			Railroad tracks two blocks away
	FS-3-A	Auburndale	X				L			Railroad tracks one block away.
	FS-3-B	Forest Hills		X			H			Forest Hills railroad station one block away.
Brooklyn	BR-1-A	Greenpoint	X			X	L			Near abandon warehouses.
	BR-1-B	Redhook	X		X		L	Gowanus Expressway (elevated)	One block	Cardinal Tank Manufaturers is about 100 ft. away. A water tunnel is being constructed nearby.
	BR-1-C	Williamsburg	X	X			M	Manhattan Bridge and Brooklyn Queens Expressway	Two blocks to each	Five blocks from the East River.
	BR-1-D	Williamsburg	X	X			M	Manhattan Bridge and Brooklyn Queens Expressway	Two blocks to each	Five blocks from the East River.
	BR-2-A	Park Slope	X	X			M			P.S. 124 is a half block away.
	BR-2-B	Borough Park	X	X			L	Gowanus Expressway (elevated)	Two Blocks	
	BR-2-C	Borough Park	X	X			L	Gowanus Expressway (elevated)	Two blocks	Commercial properties are one-half block away.
	BR-2-D	Flatbush	X				L			High rise apartment building and single family homes nearby.
	BR-3-A	Greenpoint				X	M	Pulaski Bridge	Three blocks	Structure is two blocks from the East River.
	BR-3-B	Greenpoint				X	M	Pulaski Bridge	Two blocks	Impounding yard on this block. Two blocks from the East River.
Manhattan	MN-1-A	Times Square	X	X			H			Resturants and a parking garage are on the block.
	MN-1-B	Radio City	X	X			M			Construction taking place near the structure.
	MN-1-C	Rockefeller Center		X			H			Across the street from Rockefeller Center.
	MN-1-D	Battery Park		X			H			Near the exit from the Brooklyn Battery Tunnel
	MN-2-A	Audubon	X	X	X		M			An auto repair shop is one block away.
	MN-2-B	Audubon	X	X	X		M			An auto repair shop is one block away.
	MN-2-C	Audubon	X	X	X		H			Restaurant, parking lots and a supermarket are on the block.
	MN-3-A	Murray Hill		X			H	Overpass; 34th St. over Park Ave.	Approx. 100 ft.	Overhead construction.
	MN-3-B	Manhattanville	X	X			L	Elevated Railway	One block away	Riverside Park is two blocks away.
	MN-3-C	Audubon	X	X	X		H			Dry Cleaner is one block away
Bronx	HG-1-A	West Farms	X	X			L			Railroad tracks and a park are one block away.
	HG-1-B	Bronx Zoo	X	X			M			The Bronx Zoo is located aross the street. Infiltration from a leaking fire hydrant.
	HG-1-C	Pelham Bay		X			H	Westchester Ave. over the Bruckner Expressway, and elevated railway.	Both within a half block	Near Pelham Bay Park.
	HG-2-A	Hub		X	X		M	Elevated railway above Westchester Ave.	Two blocks	Vacant lots and buildings and high school athletic field are nearby.
	HG-2-B	Boulevard	X	X			L			Adjacent to a lot with abandoned cars.
	HG-2-C	Morris Heights	X	X			L			Near a Junior high school. Infiltration from a pipe to another service box.
	HG-3-A	Eastchester	X				H			Junior high school and high school athletic field are on this block.
	HG-3-B	Park Chester	X				L	Elevated railway	Two blocks away	
	HG-3-C	Park Chester	X				L	Elevated Railway	One and a half blocks	

Notes
[a] Traffic flow designated by: L for light traffic, M for medium traffic, and H for heavy traffic
[b] Distance to bridge evaluated within a 3-block radius

Table 4-2
Operational Information

Location Code	Con Ed Structure Number	Date of Maintenance	Maintenance Performed
FS-1-A	TM6932	5/26/94	Retrofill with non-PCB oil; feeder cable if outage. Last serviced in 1993.
FS-1-B	VS388	5/26/94	Replaced existing transformer with new one. Old transformer is being serviced. Needed to clean structure prior to hook up of new transformer.
FS-1-C	VS7608	5/26/94	Scheduled routine maintenance; remote control change-out.
FS-2-A	TM6301	5/27/94	Reconditioning and oil change-out.
FS-2-B	VS7607	5/27/94	Replacing oil after structure is cleaned.
FS-2-C	M14587	5/27/94	Replacing feeder joint after structure is cleaned.
FS-2-D	SB1231	5/27/94	Recently serviced within past 6 months. Service of secondary after clean out.
FS-3-A	SB51316	5/31/94	Cable service required after structure is cleaned.
FS-3-B	M12243	5/31/94	Cable service required after structure is cleaned.
BR-1-A	M8370	6/1/94	Lead cased cable to be pulled and replaced after structure is cleaned.
BR-1-B	M2461	6/1/94	New set of lead joints replaced a month ago. A new set of wires to be added after structure is cleaned.
BR-1-C	M726	6/1/94	New splices to be installed after clean out. Requires removal of asbestos wrap and PCB oil; solder and shrink wrap.
BR-1-D	M789	6/1/94	Removing wrap and splicing to be performed after structure is cleaned.
BR-2-A	SB52965	6/2/94	Line removal typically performed.
BR-2-B	SB48297	6/2/94	Replacing cables after structure is cleaned.
BR-2-C	SB48656	6/2/94	Replacing cables after structure is cleaned.
BR-2-D	SB22994	6/2/94	Replacing cables after structure is cleaned.
BR-3-A	M4281	6/3/94	Routine cleaning.
BR-3-B	M4283	6/1/94	Routine clean out. Cable service after structure is cleaned.
MN-1-A	SB9109	6/8/94	Follow up to emergency service performed in 5/94.
MN-1-B	SB9458	6/8/94	Splicing of secondary cable with lead insulation after structure is cleaned.
MN-1-C	M33848	6/8/94	Emergency service. Failure on single. Splicing to be performed after structure is cleaned.
MN-1-D	VS3000	2/1/93	Engineer's request. Repaired missing fuse cover.
		1/14/93	Water level > 6 inches. Clogged drain repaired. Fuse cover missing.
		5/23/93	Follow up. Flush and clean required.

Table 4-2
Operational Information

Location Code	Con Ed Structure Number	Date of Maintenance	Maintenance Performed
MN-2-A	SB23477	6/9/94	Replacing wires after structure is cleaned.
MN-2-B	SB23478	6/9/94	Replacing wires after structure is cleaned.
MN-2-C	M25176	6/9/94	Splicing to be performed after structure is cleaned.
MN-3-A	V4561	6/10/94	Routine cleaning.
MN-3-A	V4561	6/20/94	Water level > 6 inches; drain clogged; excessive solids. Heavy corrosion under transformer.
MN-3-A	V4561	11/3/93	Follow up; oil check.
MN-3-B	SB30187	6/10/94	Replace wires after structure is cleaned.
MN-3-C	M24883	6/10/94	Replace cables after structure is cleaned.
HG-1-A	SB11010	7/12/94	Emergency service. Possible burnout.
HG-1-B	M13341	7/12/94	Electrical problems in 4 buildings nearby. Primary is being removed from this structure so service can be performed after structure is cleaned.
HG-1-C	F7160	7/12/94	Suspected burnout. Wires to be pulled after structure is cleaned.
HG-2-A	M1496	7/14/94	Burnout. Secondary to be cut and replaced after structure is cleaned.
HG-2-B	SB15422	7/14/94	Splicing of secondary to be performed after structure is cleaned.
HG-2-C	SB18976	7/14/94	Splicing to be performed after structure is cleaned.
HG-3-A	M23437	7/15/94	Splicing to be performed after structure is cleaned.
HG-3-B	M13521	7/15/94	Splicing and repair of burnout after structure is cleaned.
HG-3-C	M3346	7/15/94	Replacing wire and splicing to be performed after structure is cleaned.

- Primary-cable information: Both manholes and transformer vaults typically contain primary cables. Individual primary-cable records (also known as "feeder records") usually indicate the length of cable, type of insulation, and date of installation. Individual primary-cable records were not available for Brooklyn, although some drawings exist. The type of insulation on the primary cables in Brooklyn was identified by Con Edison personnel.

- Transformer vault records: The records the included type of transformer, date of installation, and concentration of polychlorinated biphenyls (PCBs) in the oil.

Structural information was used to supplement and corroborate observations made in the field, specifically regarding the presence of lead and PCBs in a structure.

Records detailing the location of asbestos arc-proofing do not exist. To compensate, any assessments made by Con Edison field personnel during this study of the type of cable and/or arc-proofing in a given structure were recorded.

While Con Edison's records can be used to determine the existence of insulation that may contain lead, they do not identify the type of joints (prefabricated or leaded) used in the structures, nor do they provide historical information. Although a structure may be identified as containing only non-lead cable, the solid phase in the structure might contain lead from maintenance activities on lead cables that were previously installed, or from existing lead joints.

Table 4-3 is a summary of structural information for each structure that was sampled.

Table 4-3
Structure and Equipment Information

Area	CH2M HILL Location ID Number	Con Edison Structure Number	Type of Structure	Cable Information: Primary: Primary Cable	Primary: Year Primary Installed	Primary: Lead Casing	Primary: Neoprene or NL[a] Insulation	Primary: Paper Insulation	Cable Information: Secondary: Secondary Cable	Secondary: Lead Casing	Secondary: Neoprene or NL[a] Insulation	Secondary: Paper Insulation	Asbestos Observed	PCB Oil Present[b]	Copper Cable	Aluminum Cable	Transformer Information: Type	Size	Year Installed	PCB Oil Count (ppm)
Queens	FS-1-A	TM6932	Transformer	X	1953		X	X	X		X				X					
	FS-1-B	VS388	Transformer	X	1994		X		X		X						G.E.	H1GA2A	1994	<10
	FS-1-C	VS7608	Transformer	X	1963		X	X	X						X		Westinghouse	GB85	1963	70
	FS-2-A	TM6301	Transformer	X	1964		?	X	X		X		X		X		Westinghouse	GB85	1964	176
	FS-2-B	VS7607	Transformer	X	1994		X		X		X		X		X		G.E.		1994	<10
	FS-2-C	M14587	Manhole	X	1994		X		X		X		X		X	X				
	FS-2-D	SB1231	Service Box	X	---	X	X		X	X	X				X	X				
	FS-3-A	SB51316	Service Box		---		X		X		X				X					
	FS-3-B	M12243	Manhole	X	1961			X	X		X		X		X	X				
Brooklyn	BR-1-A	M8370	Manhole	X	---	X			X	?	X				X					
	BR-1-B	M2461	Manhole	X	---	X	X		X	X					X					
	BR-1-C	M726	Manhole	X	---	X		X	X	X	X		X	X	X					
	BR-1-D	M784	Manhole	X	---	X	X		X	X	X		X	X	X					
	BR-2-A	SB52965	Service Box						X	X	X				X	X				
	BR-2-B	SB48297	Service Box	X	---				X	X	X				X					
	BR-2-C	SB48656	Service Box						X	X	X				X	X				
	BR-2-D	SB22994	Service Box						X	X	X				X					
	BR-3-A	M4281	Manhole	X	---	X	X		X	X	X		X		X	X				
	BR-3-B	M4283	Manhole	X	---	X	X		X		X	X	X		X	X				
Manhattan	MN-1-A	M9109	Manhole	X	---	X	X		X		X				X	X				
	MN-1-B	SB9458	Service Box						X	X				X	X					
	MN-1-C	M33848	Manhole	X	---	X			X	X	X				X					
	MN-1-D	VS3000	Transformer	X	---	X			X	?			?	X	X		Westinghouse	1000 kVA	1960	61
	MN-2-A	SB23477	Service Box	X	---		X		X		X				X	X				
	MN-2-B	SB23478	Service Box	X	---		X		X		X				X					
	MN-2-C	M25176	Manhole	X	1984		X		X		X				X					
	MN-3-A	V4561	Transformer	X	---		X		X						X		Westinghouse	1000 kVA	1984	12
	MN-3-B	SB30187	Service Box						X	X	X				X					
	MN-3-C	M24883	Manhole	X	---	X	?		X	X	X				X					
Bronx	HG-1-A	SB11010	Service Box	X	---		X		X		X				X	X				
	HG-1-B	M13341	Manhole	X	---	X			X	X	X				X	X				
	HG-1-C	F7160	Service Box						X		X				X					
	HG-2-A	M1496	Manhole	X	---		X		X		X				X	X				
	HG-2-B	SB15422	Service Box						X		X				X					
	HG-2-C	SB18976	Service Box						X		X				X					
	HG-3-A	M23437	Manhole	X	1950'S	X	X	X	X		X				X	X				
	HG-3-B	M13521	Manhole	X	---	X	X	X	X	X	X		X		X	X				
	HG-3-C	M3346	Manhole	X	1960'S	X	X	X	X	X	X		X		X					

--- Unknown; data not available
N/A Not applicable. Sample not collected or analyzed for
ND Sample was analyzed but was not detected.
[a] NL Non-leaded insulation (includes rubber, polyethylene, etc.)
[b] PCB oil present in cables based upon interviews with Con Edison personnel
Note: Data based upon field observations, review or M&S plates, primary feeder records, and interviews with Con Edison personnel.

Section 5
Discussion of Analytical Results

This section presents a summary of the types of structures sampled in 1994 and a description of the analytical results. Referenced general summary tables are provided at the end of this section. The analytical results for solid-phase and street sweep samples are presented in tabular form in Appendix B. Analytical results for samples of truck solids are presented in Appendix C. Analytical results for liquid-phase and overflow-water samples are presented in tabular form in Appendix D. Laboratory data and reporting limits are presented in Appendix E.

5.1 General Description of Sampled Structures

A total of 38 structures was sampled in 1994: 7 were transformers, 17 were manholes, and 14 were service boxes. Samples were collected from Queens, Brooklyn, Manhattan, and the Bronx. No structures were sampled in Westchester or on Staten Island in 1994. As shown in Table 5-1, each type of structure was sampled at least twice in each district, except for transformer vaults.

Table 5-1
Summary of Sampled Structures by Geographic Area

Area	Transformer Vaults	Manholes	Service Boxes	Total
Queens	5	2	2	9
Brooklyn	0	6	4	10
Manhattan	2	4	4	10
Bronx	0	5	4	9
TOTAL	7	17	14	38

Solid-phase samples were collected from 87 percent of the sampled structures. Liquid-phase samples were collected from 68 percent of the sampled structures. Table 5-2 summarizes the solid-phase, liquid-phase, and street sweep samples collected from various structures in each geographic area. Additional relationships between the analytical data and the profiles developed for each structure are discussed later in this section.

Table 5-2
Summary of Solid-Phase, Liquid-Phase, and Street Sweep Samples by Geographic Area

Area	Transformer Vaults			Manholes			Service Boxes			Total		
	Solid Phase	Liquid Phase	Street Sweep	Solid Phase	Liquid Phase	Street Sweep	Solid Phase	Liquid Phase	Street Sweep	Solid Phase	Liquid Phase	Street Sweep
Queens	5	4	5	2	0	2	2	1	2	9	5	9
Brooklyn	0	0	0	6	4	6	4	4	4	10	8	10
Manhattan	0	1	2	3	4	4	3	3	4	6	8	10
Bronx	0	0	0	5	3	5	3	3	4	8	6	9
TOTAL	5	5	7	16	11	17	12	11	14	33	27	38

5.2 Analytical Results for Solid-Phase and Street Sweep Samples

Of the 38 structures sampled, 33 solid-phase samples were collected, as described in Section 3. Statistical summaries of solids, lead, toxicity characteristic leaching procedure (TCLP) lead, total petroleum hydrocarbon (TPH), and polychlorinated biphenyl (PCB) concentrations for solid-phase and street sweep samples are summarized in tables 5-3 through 5-11 at the end of this section. Statistical summaries are presented by district and structure type.

Analytical results for the solid-phase and street sweep samples are presented together to facilitate evaluation of the significance of structural factors and environmental factors on the solids in the underground structures.

5.2.1 Solids

The solids data are discussed first so that additional relationships with lead, TPH, and PCBs can be discussed in subsequent subsections.

The average percentage of solids in the solid-phase samples and the street sweep samples was fairly consistent among districts and among structure types. The average solids concentration in the solid-phase samples was 61 percent. Solids ranged from 21 percent to 91 percent in all of the solid-phase samples. No correlation could be made between the depth of liquid-phase in the structure and the percentage of solids in the solid-phase samples. The average solids concentration in the street sweep samples was 87 percent. Solids ranged from 58 percent to 99 percent in all of the street sweep samples.

5.2.2 Lead

The average lead concentration in solid-phase samples was 2,100 milligrams per kilogram (mg/kg). Lead concentrations in the solid-phase samples ranged from 97 mg/kg to 11,000 mg/kg. Within each district, the average lead concentration in the solid-phase samples was the same order of magnitude. The maximum solid-phase lead concentrations for Queens, Brooklyn, and Manhattan were an order of magnitude higher than the maximum lead concentration observed in the Bronx.

Solid-phase samples from manholes had the highest lead concentrations in comparison to other types of structures. The average lead concentration in solid-phase samples collected from manholes was 3,320 mg/kg. The average lead concentration in solid-phase samples collected from service boxes and transformer vaults was 1,040 mg/kg and 780 mg/kg, respectively. Generally, as concentrations of solids increased, lead concentrations also increased in solid-phase samples.

The average lead concentration in street sweep samples was 780 mg/kg, which is an order of magnitude lower than the average lead concentrations in solid-phase samples. Lead concentrations in street sweep samples ranged from 91 mg/kg to 5,600 mg/kg. Lead concentrations from street sweep samples collected in Brooklyn were approximately two times higher than average lead concentrations in Queens, Manhattan, and the Bronx. The

average and minimum lead concentrations in street sweep samples were similar for all three types of structures sampled.

The average and maximum street sweep lead concentrations observed in each district were lower than the average and maximum lead concentrations in solid-phase samples in the same district. A comparison of lead concentrations in solid-phase samples and street sweep samples is presented graphically by district in Appendix F. In general, lead concentrations in street sweep samples were similar to, or significantly lower than lead concentrations in corresponding solid-phase samples.

5.2.3 TCLP Lead

The average lead concentration for all solid-phase samples subjected to the TCLP was 5.0 mg/L, which is equal to the TCLP regulatory level for lead. TCLP lead concentrations in solid-phase samples ranged from nondetectable to 31 mg/L. Of the solid-phase samples, 79 percent were below the TCLP regulatory limit for lead. All solid-phase samples collected from structures in Queens were below the TCLP regulatory level for lead.

Solid-phase samples from manholes were more likely to exceed the TCLP regulatory level for lead in comparison to other types of structures. None of the solid-phase samples from transformer vaults exceeded the TCLP regulatory level for lead. No correlation was observed between TCLP lead concentrations and percentage of solids in solid-phase samples. Generally, TCLP lead concentrations increased with increasing total lead concentrations.

Ninety-three percent of the street sweep samples were below the TCLP regulatory level for lead. In general, the TCLP lead concentrations in the street sweep samples were lower than for the solid-phase samples, except for one sample collected near a manhole in the Bronx. The TCLP lead concentration in the street sweep sample was 12 mg/L in comparison to 6.9 mg/L in the solid-phase sample.

5.2.4 TPH

TPH was detected in every solid-phase and street sweep sample. The average TPH concentration in solid-phase samples was 7,550 mg/L. TPH concentrations in solid-phase samples ranged from 55 mg/L to 53,000 mg/L. Average TPH concentrations were the same order of magnitude in all four districts. Solid-phase samples collected from service boxes and transformer vaults had average TPH concentrations that were five times higher than in the sampled manholes. Average TPH concentrations in service boxes, transformer vaults, and manholes were 12,520 mg/L, 13,000 mg/L, and 2,130 mg/L, respectively.

The TPH concentrations in street sweep samples ranged from 400 mg/L to 26,000 mg/L, the average being 4,170 mg/L. Street sweep samples collected from Brooklyn and Manhattan had higher TPH concentrations than those from Queens and the Bronx. Street sweep samples collected near service boxes and transformer vaults had higher TPH concentrations than those collected near manholes. The average TPH concentrations in street sweep samples collected adjacent to service boxes, transformer vaults, and manholes were 5,780 mg/L, 2,720

mg/L, and 4,030 mg/L, respectively. TPH concentrations in street sweep samples and solid-phase samples is presented by district in Appendix G.

5.2.5 PCBs

Only solid-phase samples were analyzed for PCBs. PCBs were detected in all samples except in those from Manhattan, where only two of six samples contained detectable concentrations of PCBs. Total PCB concentrations ranged from nondetectable to 47 mg/kg in the solid-phase samples. Average PCB concentrations were one to two orders of magnitude higher in Queens and Brooklyn than in Manhattan and the Bronx. Average PCB concentrations were one order of magnitude higher in solid-phase samples collected from manholes and transformers in comparison to samples collected from service boxes. In general, no direct correlations were observed between PCB concentrations and percent solids or between PCB concentrations and TPH concentrations. For transformer vaults, however, as TPH concentrations in solid-phase samples increased, PCB concentrations also increased.

5.2.6 Asbestos

A summary of the structures where asbestos was identified by Con Edison field personnel (either flush crews or splicing crews) during the sampling program is presented in Table 5-12. Solid-phase samples were collected from all structures that were identified as having asbestos except for one transformer vault in Manhattan. Solid-phase, street sweep, and truck solids samples were analyzed for asbestos. Chrysotile was the only type of asbestos that was detected in the samples. The chrysotile concentrations are summarized in Table 5-12 at the end of this section. All of the samples collected during the study had concentrations of asbestos less than 1 percent by weight.

Con Edison field personnel identified 11 structures containing asbestos arc-proofing. Of the sampled structures, asbestos was detected in six solid-phase samples at concentrations of less than 1 percent and was not detected in the remaining solid-phase samples. Asbestos was detected in four additional structures (three samples at less than 1 percent, and one sample at one percent), although they were not identified in the field as containing asbestos in the structure. Only two street sweep samples were found with detectable quantities of asbestos at concentrations of less than 1 percent.

5.3 Analytical Results of Truck Solids Samples

Three samples of truck solids were collected from each district, as described in Section 3. Analytical results are discussed below. Solids, lead, TCLP lead, TPH, and PCB concentrations for truck solids samples are summarized in tables 5-13 through 5-17 at the end of this section. Statistical summaries are presented by district and by structure type. The average daily concentration of each parameter in solid-phase samples and in truck solids samples are compared in Appendix H.

5.3.1 Solids

The solids data are discussed first so that further relationships with lead, TPH, and PCBs can be developed in subsequent subsections.

Solids ranged from 27 percent to 78 percent in truck solids samples. The average amount of solids in the truck solids sample was 61 percent, which is equal to the average percentage of solids in the solid-phase samples collected from the underground structures. Solids samples collected from vactor trucks had a higher average percentage of solids (74 percent) in comparison to solids samples collected from flush trucks (57 percent).

5.3.2 Lead

Lead was detected in all 12 truck solids samples. The average lead concentration in the truck solids samples was 3,100 mg/kg. Lead concentrations ranged from 420 mg/kg to 19,000 mg/kg in the truck solids. Average lead concentrations in Queens, Manhattan, and the Bronx were an order of magnitude greater than lead concentrations in truck solids samples collected in Brooklyn. No correlation was observed between the average daily lead concentration in the solid-phase samples and the lead concentration in the truck solids samples.

5.3.3 TCLP Lead

Half the truck solids samples had TCLP lead concentrations below the TCLP regulatory level of 5 mg/L lead. None of the truck solids samples collected in Queens exceeded the TCLP regulatory level for lead. In two cases, the truck solids samples had concentrations higher than the TCLP regulatory level when only one of the underground structures sampled also exceeded the TCLP lead regulatory level for lead. Some truck samples had concentrations higher than the TCLP regulatory level for lead even though the corresponding solid-phase samples did not. This could be attributed to a variety of factors, including homogeneity and distribution of lead within the structure.

5.3.4 TPH

TPH was detected in every truck solids sample collected. The TPH concentrations ranged from 330 mg/kg to 48,000 mg/kg. The average TPH concentration in the truck solids was 7,540 mg/kg, which is similar to the average TPH concentration of 7,550 mg/kg in the solid-phase samples from the underground structure. The average TPH concentration in truck solids samples collected in Manhattan was an order of magnitude higher than the concentration in samples collected in Queens, Brooklyn, and Manhattan.

5.3.5 PCBs

PCBs were detected in every truck solids sample, ranging from 0.16 mg/kg to 6.9 mg/kg. The average PCB concentration in the truck solids samples was 1.6 mg/kg, which is lower than the average PCB concentration in the solid-phase samples (3.6 mg/kg). Average concentrations were similar in all four districts.

5.3.6 Asbestos

Asbestos was detected in four truck solids samples (one from each district) in concentrations less than 1 percent by weight. None of the truck solids samples was found to be asbestos containing material. Asbestos was detected only in truck solids samples when two or more solid-phase samples had detectable concentrations of asbestos, except for one sample collected in Manhattan (MN-TD-1-A). Neither of the two solid-phase samples collected in Manhattan contained detectable concentrations of asbestos.

5.4 Analytical Results of Liquid-Phase Samples

Of the 38 structures sampled, 27 free liquid-phase samples were collected as described in Section 3. The depth of the standing liquid in the structures ranged from 1 to 2 inches to approximately 5 feet. Infiltration was observed in 10 of the 27 sampled structures. Water levels in structures with observed infiltration were typically greater than 1 foot. Several structures contained a few feet of standing water, although infiltration was not observed. The presence of water in the structures is probably the result of stormwater run-off. Although some structures close to water bodies were observed to have infiltration, no direct correlation was observed between the type of structure or geographic area and the depth of the liquid in the structure.

Total suspended solids (TSS), total lead, total cadmium, total copper TPH, and PCBs are summarized by district and type of structure in tables 5-18 through 5-23 at the end of this section. Summaries of TCLP lead and TCLP cadmium were not developed because they were well below the regulatory levels.

Although the liquid that was sampled was not discharged directly to the City sewer system, the quality of the liquid phase is compared with the applicable sewer-use limits to assist in the feasibility evaluation. The quality of the liquid-phase samples and the quality of the overflow samples are compared further in Section 6.

5.4.1 TSS

TSS were detected in every liquid-phase sample collected. The average TSS concentration in the liquid phase was 3,100 mg/L. TSS concentrations ranged from 4 mg/L to 39,000 mg/L. It was observed that TSS concentrations decreased with increasing depth of water in the structure.

Liquid-phase samples from service boxes had the highest TSS concentrations in comparison to other types of structures. The average TSS concentration in liquid-phase samples from services boxes was 6,000 mg/L. Average TSS concentrations in liquid-phase samples from manholes and transformer vaults were 1,100 mg/L and 290 mg/L, respectively.

5.4.2 Lead and TCLP Lead

Lead was detected in every liquid-phase sample analyzed. The overall average lead concentration was 2.5 mg/L. Concentrations ranged from nondetectable to 25 mg/L. Approximately one-quarter of the liquid-phase samples had lead concentrations higher than the sewer-ordinance limit of 2.0 mg/L. In general, as TSS concentrations increased, lead concentrations also increased.

TCLP lead was not detected in the liquid-phase samples collected. Therefore, potential sources of TCLP lead are not discussed.

The average lead concentrations in liquid-phase samples collected from service boxes and manholes were 3.0 mg/L and 2.9 mg/L, respectively. The average lead concentration in liquid-phase samples collected from transformer vaults was 0.53 mg/L, which is an order of magnitude lower than the average concentrations for service boxes and manholes. Three quarters of the liquid-phase samples had lead concentrations below the sewer-use limit for lead. Of the samples that had lead concentrations higher than the sewer-use limit for lead, five were collected from service boxes, one was collected from a manhole, and one was collected from a transformer vault.

5.4.3 Cadmium and TCLP Cadmium

Cadmium was detected in 11 of the 27 liquid-phase samples collected (41 percent). Concentrations ranged from nondetectable to 0.072 mg/L. All of the liquid-phase samples had cadmium concentrations below the sewer-use regulatory limit for cadmium. TCLP cadmium was not detected in any of the analyzed liquid-phase samples. Because the presence of cadmium is well below regulatory limits, potential sources were not investigated during this study.

5.4.4 Copper

Copper was detected in 78 percent of the liquid-phase samples. The average copper concentration was 1.7 mg/L. Concentrations were variable and ranged from nondetectable to 11 mg/L. Only two samples (7 percent) had concentrations higher than the sewer-use copper limit of 5 mg/L. The samples came from service boxes in Brooklyn and Manhattan. The corresponding TSS concentrations for the samples were 28,000 mg/L and 39,000 mg/L, respectively. This finding supports the conclusions reached during previous investigations that copper concentrations are associated with particulate solids.

The average copper concentration in liquid-phase samples collected from service boxes was 2.8 mg/L, which is an order of magnitude greater than the average copper concentrations in liquid-phase samples collected from manholes and transformers. The average copper concentrations in liquid-phase samples collected from manholes and transformers were 0.73 mg/L and 0.58 mg/L, respectively.

5.4.5 TPH

TPH was detected in approximately three-quarters of the liquid-phase samples collected. Concentrations were variable, ranging from nondetectable to 580 mg/L. Two-thirds of the liquid-phase samples had concentrations below the TPH sewer ordinance level of 50 mg/L.

Of the samples that had concentrations higher than the sewer-use limit for TPH, two were collected from manholes, five were collected from service boxes, and two were collected from transformer vaults. Of the nine structures that had TPH concentrations greater than 50 mg/L, seven were noted in the field to have oily sheen, odor, or both.

5.4.6 PCBs

PCBs were detected in 4 of the 27 liquid-phase samples (15 percent). No correlation was observed between liquid-phase TSS and PCBs or between TPH concentrations and PCB concentrations.

PCBs were not detected in liquid-phase samples collected from services boxes, although service boxes were the type of structure sampled most often. PCBs were detected in liquid-phase samples collected from three manholes and one transformer vault.

5.4.7 Field Measured Parameters

Liquid-phase samples were analyzed in the field for pH and temperature. The measurements are presented in Appendix A. All samples were within the City sewer-use pH range of 5.0 to 11 except for two liquid-phase samples. Those samples (one from Brooklyn and one from Manhattan) had pH values of 11.6 and 12.0 respectively. The values are considered anomalies because of the use of solvent degreasers during servicing of cable.

5.5 Analytical Results of Overflow-Water Samples

Ten overflow-water samples were collected during the sampling period. Nine were from flush trucks, and one was from a vactor truck. Table 5-24 summarizes the overflow-water samples collected, showing the district and the reason for the overflow.

TSS, lead, cadmium, copper, TPH, and PCB concentrations are summarized by district and truck type in tables 5-25 through 5-30 at the end of this section. Statistical summaries for TCLP lead and TCLP cadmium are not presented because they were well below the regulatory levels.

5.5.1 TSS

TSS was detected in every sample of overflow water. TSS concentrations in the samples were highly variable, ranging from 55 to 6,000 mg/L. The average TSS concentration was 1,320 mg/L.

6800 only one sample

TSS concentrations in the overflow-water samples collected from flush trucks ranged from 55 to 3,800 mg/L. The average overflow TSS concentration in samples from flush trucks was 796 mg/L. The average TSS concentration from vactor trucks was ~~6,800~~ mg/L, which is almost twice that of the maximum observed concentration from flush trucks. Vactor trucks use less water than flush trucks during operation, which could result in a higher solids concentration in the vactor truck.

TSS concentrations in overflow-water samples collected in Manhattan and the Bronx were an order of magnitude lower than the average TSS concentration in overflow-water samples from Queens. This difference could be due to various factors, including the amount of solids collected from the underground structures before the overflow and the volume of water collected from the structure that caused the overflow.

5.5.2 Lead and TCLP Lead

Lead was detected in every overflow-water sample analyzed. The average lead concentration in the samples was 4.2 mg/L. Twenty percent of the overflow-water samples had lead concentrations below the sewer-use limit of 2 mg/L of lead.

The average lead concentration in flush truck overflow was 2.7 mg/L. The lead concentrations in the flush truck overflow-water samples ranged from 0.48 to 5.6 mg/L. The lead concentration in vactor truck overflow was 17 mg/L. Lead concentrations in seven of the flush truck overflow-water samples and the vactor truck overflow-water sample were higher than the sewer-use limit for lead. According to results from previous investigations, the lead is present in the particulate form.

The TCLP lead results indicate that hazardous waste is not being discharged to the city sewer system during flush truck operations. Only one overflow water sample (from a flush truck in the Bronx) had a detectable TCLP lead concentration. All the overflow-water samples contained TCLP lead concentrations below the TCLP lead regulatory level of 5 mg/L.

5.5.3 Cadmium and TCLP Cadmium

Cadmium concentrations ranged from nondetectable to 0.10 mg/L. All overflow-water samples collected had cadmium concentrations below the sewer-use limit level of 2 mg/L. The cadmium concentration in flush truck overflow-water samples was 0.017 mg/L. Cadmium concentrations ranged from nondetectable to 0.10 mg/L in the flush truck overflow-water samples. The cadmium concentration in the overflow-water sample from the vactor truck was 0.091 mg/L.

The TCLP cadmium results indicate that hazardous waste is not being discharged to the city sewer system during flush truck operations. Only one overflow-water sample (from a vactor truck in Queens) had a detectable TCLP cadmium concentration. All of the overflow-water samples had concentrations below the TCLP cadmium regulatory level of 1 mg/L.

5.5.4 Copper

Copper was detected in all overflow-water samples. The average concentration was 1.8 mg/L. Concentrations ranged from 0.083 mg/L to 8.4 mg/L. Only one overflow-water sample (from a flush truck in Manhattan) had a concentration higher than the sewer-use limit of 5 mg/L.

The average copper concentration in the overflow-water samples collected from flush trucks was 1.7 mg/L. Copper concentrations in the flush truck overflow-water samples ranged from 0.083 to 8.4 mg/L. The copper concentration in the overflow-water sample from the vactor truck was 2.4 mg/L.

5.5.5 TPH

TPH concentrations in the overflow-water samples also were highly variable, ranging from 1.1 to 180 mg/L. The overall average TPH concentration was 30 mg/L. Only one overflow-water sample from a flush truck (from Brooklyn) had a TPH concentration higher than the sewer-use level of 50 mg/L. The next-highest TPH concentration was 49 mg/L, which is slightly lower than the sewer-use limit. The TPH concentration in the vactor truck overflow was 1.1 mg/L, which is significantly lower than the sewer-use limit.

5.5.6 PCBs

PCBs were detected in 8 of the 10 samples of overflow water. PCB concentrations were variable, ranging from nondetectable to 22 µg/L. The average total detected PCB concentration was 6 µg/L. The total detected PCB concentrations in the overflow-water samples collected from flush trucks ranged from nondetectable to 68 µg/L. The average total detected PCB concentration in the flush truck overflow was 37 µg/L. The total PCB concentration in the overflow-water sample collected from the vactor truck was 22 µg/L.

5.5.7 Field Measured Parameters

Measurements of pH and temperature in overflow-water samples are presented in Appendix A. All samples of overflow-water were within the sewer-ordinance regulatory pH range of 5 to 11.

5.6 Comparison of Analytical Results from Liquid-Phase and Overflow-Water Samples

An overflow from a flush truck or a vactor truck to the City sewer system occurred when a truck exceeded its capacity while it was cleaning out an underground structure. This typically occurred when a structure contained a large volume of water because of stormwater run-off or infiltration. Overflows occurred more often when trucks were cleaning manholes or transformer vaults, which are larger structures than service boxes. Under this system, solids and contaminants collected from previously cleaned structures may have been released from the body of the truck to the City sewer. Although analytical results from the overflow-water

samples show that hazardous waste was not being discharged to the City sewer system in overflows, copper, lead, PCBs, and TPH concentrations in the overflows were higher in some instances than the regulatory levels of sewer ordinances.

The analytical results for TSS, copper, lead, TPH, and PCBs for the 10 overflow-water samples were compared with the corresponding liquid-phase results in Table 5-31 at the end of this section. Liquid-phase samples were not collected from two of the structures listed because conditions within the structures were too dangerous.

TSS, copper, lead, and PCB concentrations were consistently lower in the liquid-phase samples than in the corresponding overflow-water samples. TPH concentrations in the liquid phase were significantly lower than the overflow-water samples for six of the eight samples. Two liquid-phase samples, however, had TPH concentrations higher than the TPH concentrations in the overflow-water samples. TPH samples were collected from the surface of the standing liquid phase in the underground structures. During an overflow, the contents of the trucks were mixed by the pumping and vacuuming, which inhibited separation of oil to the top of the tank where an overflow would occur.

Table 5-3
Summary of Solids Concentrations in Solid-Phase Samples

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Average	61	66	56	54	65	54	67	57
Minimum	21	39	21	30	37	21	30	39
Maximum	91	91	79	80	87	87	91	82

All units in percent.

Table 5-4
Summary of Solids Concentrations in Street Sweep Samples

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Average	87	82	90	90	85	88	88	83
Minimum	58	58	80	82	76	76	77	58
Maximum	99	94	97	99	99	99	99	97

All units in percent.

Table 5-5

Summary of Lead Concentrations in Solid-Phase Samples[a]

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Average	2,100	1,740	2,590	3,200	1,080	1,040	3,320	780
Minimum	97	97	110	780	140	97	110	390
Maximum	11,000	11,000	11,000	10,000	2,900	4,000	11,000	1,900

All units in mg/kg

Note:

[a] Lead was detected in all samples

Table 5-6

Summary of Lead Concentrations in Street Sweep Samples[a]

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Average	780	460	1,260	680	670	730	860	700
Minimum	91	93	. 330	120	91	91	120	97
Maximum	5,600	1,500	5,600	1,300	1,400	1,600	5,600	1,500

All units in mg/kg

Note:

[a] Lead was detected in all samples

Table 5-7
Summary of TCLP Lead Concentrations in Solid-Phase Samples

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Number of Samples with Concentrations Below the TCLP regulatory level of 5 mg/L	26 of 33	9 of 9	7 of 10	5 of 6	5 of 8	11 of 12	10 of 16	5 of 5
Average[a]	5.0	0.83	8.7	6.6	3.8	4.0	7.1	0.69
Minimum	ND	ND	1.0	ND	ND	ND	ND	ND
Maximum	31	2.5	31	28	9.9	28	31	1.3

All units in mg/L
ND Analyzed for but not detected

Note:
[a]Average based upon the substitution of the reporting limit for those values that were not detected

Table 5-8
Summary of TCLP Lead Concentrations in Street Sweep Samples

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Number of Samples with Concentrations Below the TCLP regulatory level of 5 mg/L	13 of 14	N/A	4 of 4	5 of 5	4 of 5	5 of 5	6 of 7	2 of 2
Average[a]	1.6	N/A	0.59	0.86	3.1	0.53	2.4	1.4
Minimum	ND	N/A	ND	ND	ND	ND	ND	ND
Maximum	12	N/A	0.72	2.3	12	0.64	12	2.3

All units in mg/L
N/A Not Applicable
ND Analyzed for but not detected

Note:
[a]Average based upon the substitution of the reporting limit for those values that were not detected

Table 5-9

Summary of TPH Concentrations in Solid-Phase Samples[a]

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Average	7,550	7,490	7,360	9,140	6,680	12,520	2,130	13,000
Minimum	55	200	5,500	200	55	860	55	470
Maximum	53,000	53,000	32,000	48,000	39,000	48,000	10,000	53,000

All units in mg/kg

Note:

[a]TPH was detected in all samples

Table 5-10

Summary of TPH Concentrations in Street Sweep Samples

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Average	4,170	2,430	4,350	7,980	1,490	5,780	2,720	4,030
Minimum	400	400	1,200	970	590	880	590	400
Maximum	26,000	4,600	11,000	26,000	2,800	26,000	9,400	13,000

All units in mg/kg

Note:

[a]TPH was detected in all samples

Table 5-11

Summary of PCB Concentrations in Solid-Phase Samples[a]

Value	Overall	Area				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Average	3.6	1.4	8.3	0.90	2.1	0.25	5.8	2.1
Minimum	ND	0.085	0.091	ND	ND	ND	ND	0.11
Maximum	47	6.5	47	4.7	10	0.85	47	6.5

All units in mg/kg

Note:

[a]PCBs were detected in all samples except for Manhattan (not detected in 2 of 6 samples) and Bronx (not detected in 3 of 8 samples)

Table 5-12

Summary of Asbestos[a] in Underground Structures

Area	Location Number	Type of Structure	Asbestos Observed in Field	Chrysotile Solid-Phase (%)	Chrysotile Street Sweep (%)
Queens	FS-1-C	Transformer	*No*	<1%	ND
	FS-2-A	Transformer	Yes	<1%	ND
	FS-2-B	Transformer	Yes	<1%	ND
	FS-2-C	Manhole	Yes	ND	ND
	FS-3-B	Manhole	Yes	ND	ND
Brooklyn	BR-1-A	Manhole	*No*	1%	ND
	BR-1-C	Manhole	Yes	<1%	<1%
	BR-1-D	Manhole	Yes	<1%	ND
	BR-2-B	Service Box	*No*	<1%	ND
	BR-3-A	Manhole	Yes	ND	ND
	BR-3-B	Manhole	Yes	ND	ND
Manhattan	MN-1-D	Transformer	?	---	ND
Bronx	HG-3-A	Manhole	*No*	<1%	<1%
	HG-3-B	Manhole	Yes	<1%	ND
	HG-3-C	Manhole	Yes	<1%	ND

? Con Edison personnel indicated that the structure might have asbestos, but were not sure

--- No data; sample was not collected

ND Analyzed for but not detected

<1% Detected in sample at a concentration less than 1%.

[a]Asbestos results for chrysotile only. Amosite, crocidolite and other asbestos forms were not detected

Table 5-13
Summary of Solids Concentrations in Truck Solids Samples

Value	Overall	District			
		Queens	Brooklyn	Manhattan	Bronx
Average	61	63	75	46	61
Minimum	27	47	71	27	49
Maximum	78	74	78	66	74

All units in percent

Table 5-14
Summary of Lead Concentrations in Truck Solids Samples[a]

Value	Overall	District			
		Queens	Brooklyn	Manhattan	Bronx
Average	3,100	6,660	780	3,770	1,280
Minimum	420	420	670	1,700	650
Maximum	19,000	19,000	980	5,400	2,200

All units in mg/kg

Note:

[a] Lead was detected in all samples

Table 5-15
Summary of TCLP Lead Concentrations in Truck Solids Samples

Value	Overall	District			
		Queens	Brooklyn	Manhattan	Bronx
Number of Samples with Concentrations Below the TCLP regulatory level of 5 mg/L	6 of 12	3 of 3	1 of 3	0 of 3	2 of 3
Average[a]	7	0.71	14	9.5	4.3
Minimum	ND	ND	4.4	7.7	2.1
Maximum	29	0.92	29	12	8.8

All units in mg/L

ND Analyzed for but not detected

Note:

[a] Average based upon the substitution of the reporting limit for those values that were not detected

Table 5-16
Summary of TPH Concentrations in Truck Solids Samples

Value	Overall	District			
		Queens	Brooklyn	Manhattan	Bronx
Average	7,540	4,200	4,570	20,100	1,240
Minimum	330	410	4,400	3,100	330
Maximum	48,000	9,400	4,700	48,000	2,100

All units in mg/kg

Note:

[a]TPH was detected in all samples

Table 5-17
Summary of Total PCB Concentrations in Truck Solids Samples

Value	Overall	District			
		Queens	Brooklyn	Manhattan	Bronx
Average	1.6	1.3	0.8	2.0	2.0
Minimum	0.16	0.93	0.25	0.16	0.53
Maximum	6.9	1.6	1.3	6.9	3.5

All units in mg/kg

Note:

[a]PCBs were detected in all samples

Table 5-18
Summary of TSS Concentrations in Liquid-Phase Samples

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Average	3,100	210	5,000	5,200	180	6,000	1,100	290
Minimum	4	15	61	4	4	4	4	15
Maximum	39,000	960	28,000	39,000	1,000	39,000	6,800	960

All units in mg/L

Table 5-19
Summary of Lead Concentrations in Liquid-Phase Samples

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Number of Samples with Concentrations Below 2.0 mg/L[a]	20 of 27	4 of 5	4 of 8	6 of 8	6 of 6	7 of 12	9 of 10	4 of 5
Average	2.5	0.50	5.5	2.6	0.16	3.0	2.9	0.53
Minimum	0.05	0.016	0.34	0.01	0.022	0.022	0.01	0.016
Maximum	25	2.3	25	14	0.62	14	25	2.3

All units in mg/L

Note:
[a]NYCDEP Sewer-use limit

Table 5-20

Summary of Cadmium Concentrations in Liquid-Phase Samples[a]

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Average[b]	0.013	0.0074	0.028	0.011	0.055	0.03	0.035	0.013
Minimum	ND	ND	ND	ND	ND	ND	ND	ND
Maximum	0.072	0.021	0.072	0.042	0.055	0.0069	0.072	0.021

Units in mg/L

ND Analyzed for but not detected

Notes:

[a]None of the samples exceeded the NYCDEP sewer-use limit for cadmium

[b]Average based upon the substitution of the reporting limit for those concentrations that were not detected

Table 5-21

Summary of Copper Concentrations in Liquid-Phase Samples

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Number of Samples with Concentrations Below 5.0 mg/L[a]	25 of 27	5 of 5	7 of 8	7 of 8	6 of 6	10 of 12	10 of 10	5 of 5
Average	1.7	0.54	2.6	1.4	0.039	2.8	0.73	0.58
Minimum	ND	ND	0.054	ND	ND	ND	ND	ND
Maximum	11	1.9	11	10	0.095	11	4.0	1.9

Units in mg/L

ND Analyzed for but not detected

Notes:

[a]NYCDEP Sewer-use limit

Table 5-22
Summary of TPH Concentrations in Liquid-Phase Samples

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Number of Samples with Concentrations Below 50 mg/L[a]	18 of 27	5 of 5	7 of 8	7 of 8	6 of 6	10 of 12	10 of 10	5 of 5
Average[b]	154	159	250	113	19.4	118	89	186
Minimum	ND	ND	3.5	ND	ND	0.79	ND	ND
Maximum	580	470	580	450	70	580	450[c]	470

All units in mg/L
ND Analyzed for but not detected

Notes:
[a]NYCDEP Sewer-use limit
[b]Average based upon the substitution of the reporting limit for those concentrations that were not detected

Table 5-23
Summary of PCB Concentrations in Liquid-Phase Samples

Value	Overall	District				Structure		
		Queens	Brooklyn	Manhattan	Bronx	Service Box	Manhole	Transformer
Number of Samples with Concentrations Below the Reporting Limit[a]	23 of 27	5 of 5	7 of 8	6 of 8	5 of 6	12 of 12	7 of 10	4 of 5
Average[b]	0.79	N/A	1.2	0.81	0.67	N/A	1.3	1.1
Minimum	ND	ND	ND	ND	ND	ND	ND	ND
Maximum	8.36	ND	8.4	4.7	3.0	ND	8.4	4.7

All units in µg/l
N/A Not applicable
ND Analyzed for but not detected

Notes:
[a]NYCDEP Sewer-use limit
[b]Average based upon the substitution of the reporting limit for those concentrations that were not detected

Table 5-24 Summary of Overflow-Water Samples				
Sample ID	**District**	**Type of Truck**	**Type of Structure**	**Reason For Overflow**
FS-OF-2-A	Queens	Flush	Transformer Vault	Infiltration to transformer vault
FS-OF-3-B	Queens	Vactor	Manhole	Truck at capacity
BR-OF-3-B	Brooklyn	Flush	Manhole	Truck at capacity
MN-OF-1-C	Manhattan	Flush	Manhole	Infiltration to manhole
MN-OF-1-D	Manhattan	Flush	Transformer Vault	Tidal infiltration
MN-OF-2-C	Manhattan	Flush	Manhole	Truck at capacity
HG-OF-1-B	Bronx	Flush	Manhole	Infiltration from fire hydrant
HG-OF-2-A	Bronx	Flush	Manhole	Truck at capacity
HG-OF-2-C	Bronx	Flush	Service Box	Truck at capacity
HG-OF-3-A	Bronx	Flush	Manhole	Truck at capacity

Table 5-25
Summary of TSS Concentrations in Samples of Overflow Water

Value	Overall	District				Truck Type	
		Queens	Brooklyn	Manhattan	Bronx	Flush	Vactor
Average	1,320	3,130	N/A	310	540	800	N/A
Minimum	55	260	N/A	270	55	55	N/A
Maximum	6,000	6,000	3,800	380	870	3,000	6,000

All units in mg/L
N/A Not applicable

Table 5-26
Summary of Lead Concentrations in Samples of Overflow Water

Value	Overall	District				Truck Type	
		Queens	Brooklyn	Manhattan	Bronx	Flush	Vactor
Number of Samples with ConcentrationsBelow 2.0 mg/L[a]	2 of 10	1 of 2	0 of 1	0 of 3	1 of 4	2 of 9	0 of 1
Average[b]	4.2	8.7	N/A	2.6	3	2.7	N/A
Minimum	0.48	0.48	N/A	2.3	0.53	0.48	N/A
Maximum	17	17	4.4	2.9	5.6	5.6	17

All units in mg/L
N/A Not applicable

Notes:
[a]NYCDEP Sewer-use limit
[b]Average based upon the substitution of the reporting limit for those concentrations that were not detected

Table 5-27
Summary of Cadmium Concentrations in Samples of Overflow Water[a]

Value	Overall	District				Truck Type	
		Queens	Brooklyn	Manhattan	Bronx	Flush	Vactor
Average[b]	0.024	0.048	N/A	0.066	0.0066	0.017	N/A
Minimum	ND	ND	N/A	0.0059	0.0044	ND	N/A
Maximum	0.1	0.091	0.1	0.0075	0.01	0.1	0.091

All units in mg/L
N/A Not applicable
ND Analyzed for but not detected

Notes:
[a]None of the samples exceeded the NYCDEP Sewer-use limit for cadmium
[b]Average based upon the substitution of the reporting limit for those concentrations that were not detected

Table 5-28
Summary of Copper Concentrations in Samples of Overflow Water

Value	Overall	District				Truck Type	
		Queens	Brooklyn	Manhattan	Bronx	Flush	Vactor
Number of Samples with Concentrations Below 5.0 mg/L[a]	9 of 10	2 of 2	1 of 1	2 of 3	4 of 4	8 of 9	1 of 1
Average	1.8	1.44	N/A	3.5	0.56	1.7	N/A
Minimum	0.083	0.47	N/A	0.68	0.083	0.083	N/A
Maximum	8.4	2.4	2.2	8.4	0.94	8.4	2.4

All units in mg/L
N/A Not applicable

Notes:
[a]NYCDEP Sewer-use limit

Table 5-29
Summary of TPH Concentrations in Samples of Overflow Water

Value	Overall	District				Truck Type	
		Queens	Brooklyn	Manhattan	Bronx	Flush	Vactor
Number of Samples with Concentrations Below 50 mg/L[a]	9 of 10	2 of 2	0 of 1	3 of 3	4 of 4	8 of 9	1 of 1
Average	30	5.4	N/A	21	11	33	N/A
Minimum	1.1	1.1	N/A	4.7	1.1	1.1	N/A
Maximum	180	9.7	180	49	22	180	1.1

All units in mg/L
N/A Not applicable

Note:
[a]NYCDEP Sewer-use limit

Table 5-30
Summary of Total PCB Concentrations in Samples of Overflow Water

Value	Overall	District				Truck Type	
		Queens	Brooklyn	Manhattan	Bronx	Flush	Vactor
Number of Samples with Concentrations Below the Reporting Limit[a]	2 of 10	0 of 2	0 of 1	1 of 3	1 of 4	2 of 9	0 of 1
Average[b]	4.3	12	N/A	2.3	2.5	2.3	N/A
Minimum	ND	1.6	N/A	ND	ND	ND	N/A
Maximum	22	22	2.32	5.3	5.1	5.3	22

All units in µg/L
N/A Not applicable
Analyzed for but not detected

Notes:
[a]NYCDEP Sewer-use limit
[b]Average based upon the substitution of the reporting limit for those concentrations that were not detected

Table 5-31

Comparison of Overflow-Water Samples to Corresponding Liquid-Phase Samples

Sample ID	TSS (mg/L)		Copper (mg/L)		Lead (mg/L)		TPH (mg/ L)		Total PCBs (µg/L)	
	Overflow	Liquid Phase	Overflow	Liquid Phase	Overflow	Liquid Phase	Overflow	Liquid Phase	Overflow	Liquid Phase
FS-2-A	260	45	0.47	0.041	0.48	0.041	9.7	470	1.6	ND
FS-3-B	6,000	---	2.4	---	17	---	1.1	---	22	---
BR-3-B	3,800	3,500	2.2	0.78	4.4	1.6	180	380	2.32	ND
MN-1-C	290	4	1.3	0.033	2.3	0.01	8.4	ND	1.5	0.72
MN-1-D	270	---	8.4	---	2.6	---	4.7	---	5.3	---
MN-2-C	380	33	0.68	ND	2.9	0.015	49	ND	ND	ND
HG-1-B	540	13	0.63	ND	2.6	0.066	14	ND	ND	ND
HG-2-A	870	8	0.94	0.041	5.6	0.62	22	ND	5.1	ND
HG-2-C	700	4	0.58	ND	3.1	0.022	5.4	3	3.3	ND
HG-3-A	55	7	0.10	ND	0.50	0.042	1.10	0.78	1.2	3.0
Average[a]	1,320	450	1.8	0.12	4.2	0.30	30	110	4.3	0.63

--- No sample collected

ND Analyzed for but not detected

Note:

[a] Average based on the substitution of the reporting limit for those values that were not detected

Section 6
Sources of Contamination in Underground Structures

To identify sources of contamination, this section develops relationships between the analytical results of the samples collected from the various structures (Section 5) and the available environmental, operational, and structural information (Section 4). The general process followed to develop the relationships is illustrated in Figure 6-1. Where applicable, potential systemwide sources of contamination also are discussed in this section.

6.1 Contamination Identified in Underground Structures

6.1.1 Solid Phase and Truck Solids

As noted in Section 5, more than three-quarters of the 34 solid-phase samples collected from underground structures had toxicity characteristics leaching process (TCLP) lead concentrations below the regulatory limit. In two samples of truck solids, concentrations were above the TCLP regulatory limit for lead; although solids from one of the structures cleaned by each truck contained solid phase with TCLP concentrations higher than the TCLP regulatory level. Potential sources of lead contamination are discussed in subsection 6.2.

Although asbestos was detected in some of the solid-phase samples and truck solids samples, none of the samples were found to be asbestos-containing material (ACM) (i.e., none had more than 1 percent asbestos by weight). Asbestos was not detected in 36 of 38 street sweep samples collected during the study, which suggests that asbestos found in the underground structures sampled during the study is not associated with environmental factors. Because asbestos was not found at levels of concern in the sampled structures, sources of asbestos were not investigated during this evaluation.

None of the solid-phase or truck solids samples were identified as material contaminated by polychlorinated biphenyls (PCBs) (i.e., none had concentrations higher than 50 mg/kg). As per the approved work plan, street sweep samples were not analyzed for PCBs because the PCBs found in the structures are believed to be associated with non-environmental sources. In addition, because concentrations observed in the solid-phase samples were low, sources of PCBs were not investigated.

6.1.2 Liquid Phase and Overflow Water

None of the liquid-phase samples were characterized as hazardous waste. Although liquids in the underground structures are not regulated directly, the analytical results were reviewed against the City sewer-use limits. Liquid-phase samples contained copper, lead, total petroleum hydrocarbons (TPHs), and PCBs in concentrations higher than the sewer-use limits. Potential sources of these constituents are discussed in subsection 6.4.

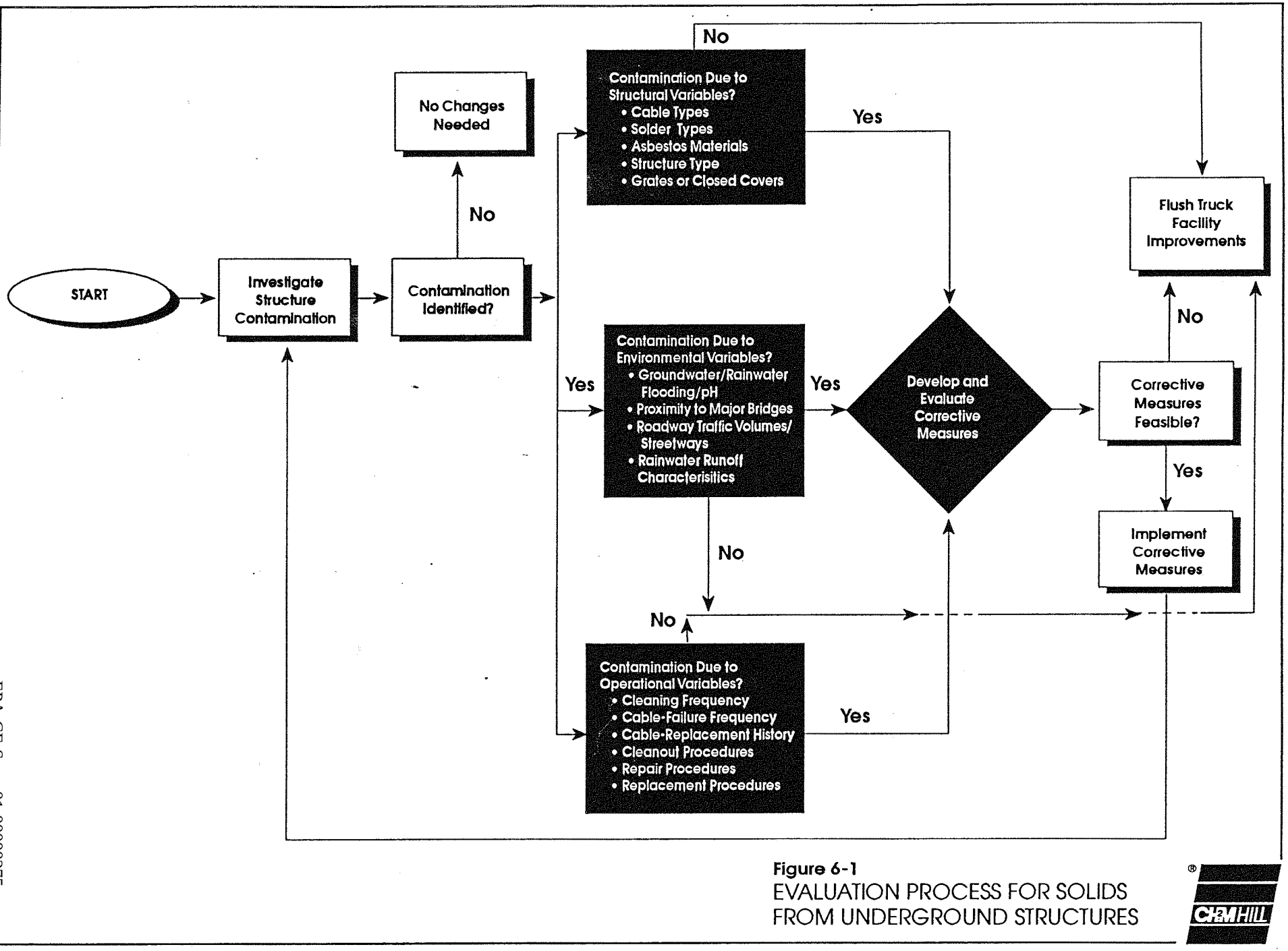


Figure 6-1
EVALUATION PROCESS FOR SOLIDS FROM UNDERGROUND STRUCTURES

CH2MHILL

While hazardous waste is not discharged to the City sewer system by the flush truck process, some samples of overflow water had concentrations of copper, lead, TPHs, and PCBs that exceeded City sewer-use limits. The relationship between the liquid phase in the underground structures and the truck overflow water is discussed later in this section, along with a discussion of recommended practices for water management. Con Edison no longer allows flush trucks or vactor trucks to discharge to the City sewer system.

6.2 Evaluation of Structures

Structures that contained solids with lead in concentrations above the TCLP lead regulatory limit were evaluated to identify potential sources of contamination. Common structural, operational, and environmental factors associated with these structures are described below.

6.2.1 Structural

More than three-quarters of the solid-phase samples collected were within the regulatory limit for TCLP lead. All samples that exceeded the TCLP regulatory limit for lead came from underground structures in which there is lead-jacketed cable. Nevertheless, solids from two-thirds of all the sampled structures in which there is lead-jacketed cable were within the TCLP limit for lead.

Of the solid-phase samples that exceeded the TCLP limit for lead, six came from manholes (three in Brooklyn and three in the Bronx) and one came from a service box in Manhattan. The manholes have lead-jacketed primary and secondary cable. The service box has lead-jacketed secondary cable (see Table 4-3 in Section 4). None of the solid-phase samples collected from transformer vaults exceeded the TCLP regulatory limit for lead; however, there is no lead-jacketed cable in any of the transformer vaults sampled.

On the basis of the limited 1994 sampling, structures having lead-jacketed cable appear to be more likely to contain solids that exceed the regulatory limit for TCLP lead than structures that have no lead-jacketed cable. Structures that never have had lead-jacketed cable are unlikely to contain solids that exceed the TCLP regulatory level for lead.

6.2.2 Operational

All solid-phase samples that exceeded the TCLP regulatory limit for lead came from structures that required maintenance involving removal of cable or burnouts of existing cable, or both. In two structures, maintenance had been performed shortly before sampling. Before the sampling (see Table 4-1 in Section 4), a set of leaded joints was observed lying in the bottom of the service box in Manhattan. Although no records are kept on routine maintenance for manholes and service boxes, field observations indicate that maintenance practices could contribute to the presence of lead in the solids drawn from structures that have lead-jacketed cable.

6.2.3 Environmental

Table 6-1 presents the TCLP lead concentrations in street sweep samples collected near structures originating solids that exceeded the TCLP regulatory limit for lead. Only one of the street sweep samples exceeded the TCLP regulatory limit for lead. As indicated in Table 6-1, the concentrations of total lead in the street sweep samples either were lower than or of the same order of magnitude as the average total lead concentration in each district. As noted in subsection 5.3.2, the concentrations of total lead in the street sweep samples were an order of magnitude lower than the average concentrations of lead in the solid-phase samples.

Table 6-1
Lead in Street Sweep Samples**

Location Number	TCLP Lead (mg/L)	Total Lead (mg/kg)	Concentration of Average Street Sweep Lead In District (mg/kg)
BR-1-B	ND	630	1,260
BR-1-C	ND	1,400	
BR-1-D	0.72	330	
MN-1-B	ND	410	684
HG-3-A	12	680	668
HG-3-B	ND	390	
HG-3-C	2.1	730	

ND: Analyzed for but not detected

Collected adjacent to structures originating solid-phase samples exceeding the TCLP lead regulatory

As shown in Table 6-2, structures with solid-phase samples that exceeded the TCLP regulatory limit for lead were located in residential, commercial, and light industrial areas. Traffic flows ranged from light to heavy. Five samples that exceeded the TCLP for lead were collected near bridges. However, nine other structures located close to elevated expressways or major bridges did not contain solids that exceeded the regulatory limit for TCLP lead.

Analysis of the street sweep samples and the variety and range of observed environmental factors indicated that the lead in the solids taken from the structures is associated only in part with external environmental sources and more closely with structural and operational factors.

Table 6-2 Environmental Factors Observed*				
Location Number	**Structure Type**	**Type of Area**	**Traffic Flow**	**Bridges**
BR-1-B	Manhole	Light Industrial	Light	Elevated expressway
BR-1-C	Manhole	Residential/Commercial	Medium	Manhattan Bridge/ Queens Expressway
BR-1-D	Manhole	Residential/Commercial	Medium	Manhattan Bridge/ Queens Expressway
MN-1-B	Service Box	Residential/Commercial	Heavy	None
HG-3-A	Manhole	Residential	Heavy	None
HG-3-B	Manhole	Residential	Light	Elevated railway
HG-3-C	Manhole	Residential	Light	Elevated railway
*Near structures originating solid-phase samples exceeding the regulatory limit for TCLP lead				

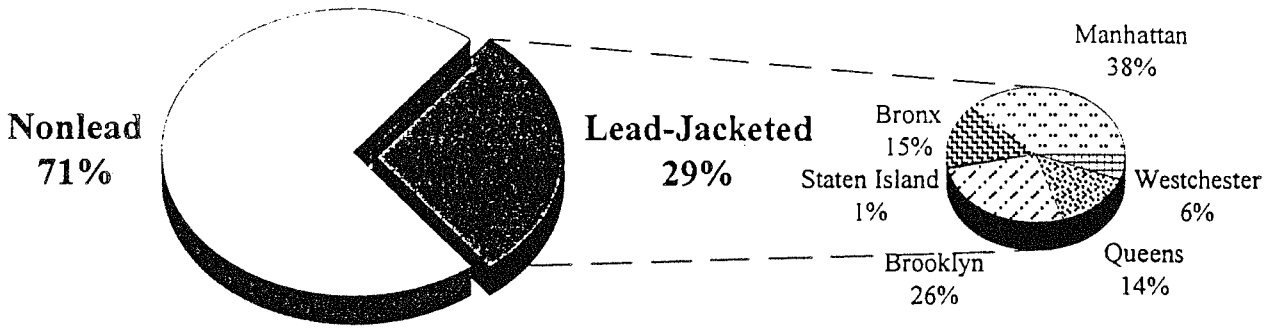
6.3 Extent of Lead in Con Edison's Underground System

The analytical results indicated that lead-jacketed cable correlates with the incidence of lead in the solid-phase samples. To determine the extent of lead-jacketed cable in Con Edison's underground system, the length and type of cable in each district were identified using Con Edison's central database. Unfortunately, the central database does not relate the length of cables to individual structures.

A summary of the distribution of lead-jacketed cable for each district is presented in Table 6-3 and depicted in Figure 6-2. The system has over 66,000 miles of underground cable. Approximately 29 percent of the underground cable has insulation that contains lead. Manhattan and Brooklyn combined have 64 percent of all the lead-jacketed cable in Con Edison's underground system. More than one-third of the cable in Manhattan, the Bronx, and Westchester is lead jacketed, and more than one-quarter of the cable in Brooklyn is lead jacketed. Although the Bronx and Westchester do not have a large portion of *all* the lead-jacketed cable in Con Edison's service area, these districts do have significant quantities of lead-jacketed cable.

Table 6-3
Summary of Lead-Jacketed Cable by Type

District	Primary Cable			Secondary Mains			Service Cable		
	Total (miles)	Lead-Jacketed (miles)	% Lead (miles)	Total (miles)	Lead-Jacketed (miles)	% Lead (miles)	Total (miles)	Lead-Jacketed (miles)	% Lead (miles)
Manhattan	4,009	2,527	63%	13,279	4,762	36%	97	0	0%
Bronx	1,872	1,332	71%	6,222	1,620	26%	5	0	0%
Staten Island	732	123	17%	117	0	0%	341	0	0%
Brooklyn	4,061	2,994	74%	13,442	2,088	16%	14	0	0%
Queens	4,126	2,529	61%	14,610	279	2%	3	0	0%
Westchester	2,128	1,025	48%	1,299	103	8%	42	0	0%
Total	16,928	10,529	62%	48,970	8,852	18%	501	0	0%



Approximate total miles of underground cable: 66,400

Figure 6-2
SUMMARY OF LEAD-JACKETED CABLE BY DISTRICT

Approximately three-quarters of all of the underground cable is secondary mains, and one-quarter is primary cable, as shown in Figure 6-3. Only 18 percent of the secondary mains is lead jacketed, although a majority (62 percent) of the primary cable is lead jacketed (Figure 6-4). According to available information, none of the service cable in the system is lead jacketed.

Figures 6-5 and 6-6 indicate the percentage of lead-jacketed cable by type for each district. In Queens and Westchester and on Staten Island, more than 90 percent of the lead-jacketed cable is primary. In Manhattan and the Bronx, the majority of the lead-jacketed cable is secondary mains. In Brooklyn, just over half of the lead-jacketed cable is primary.

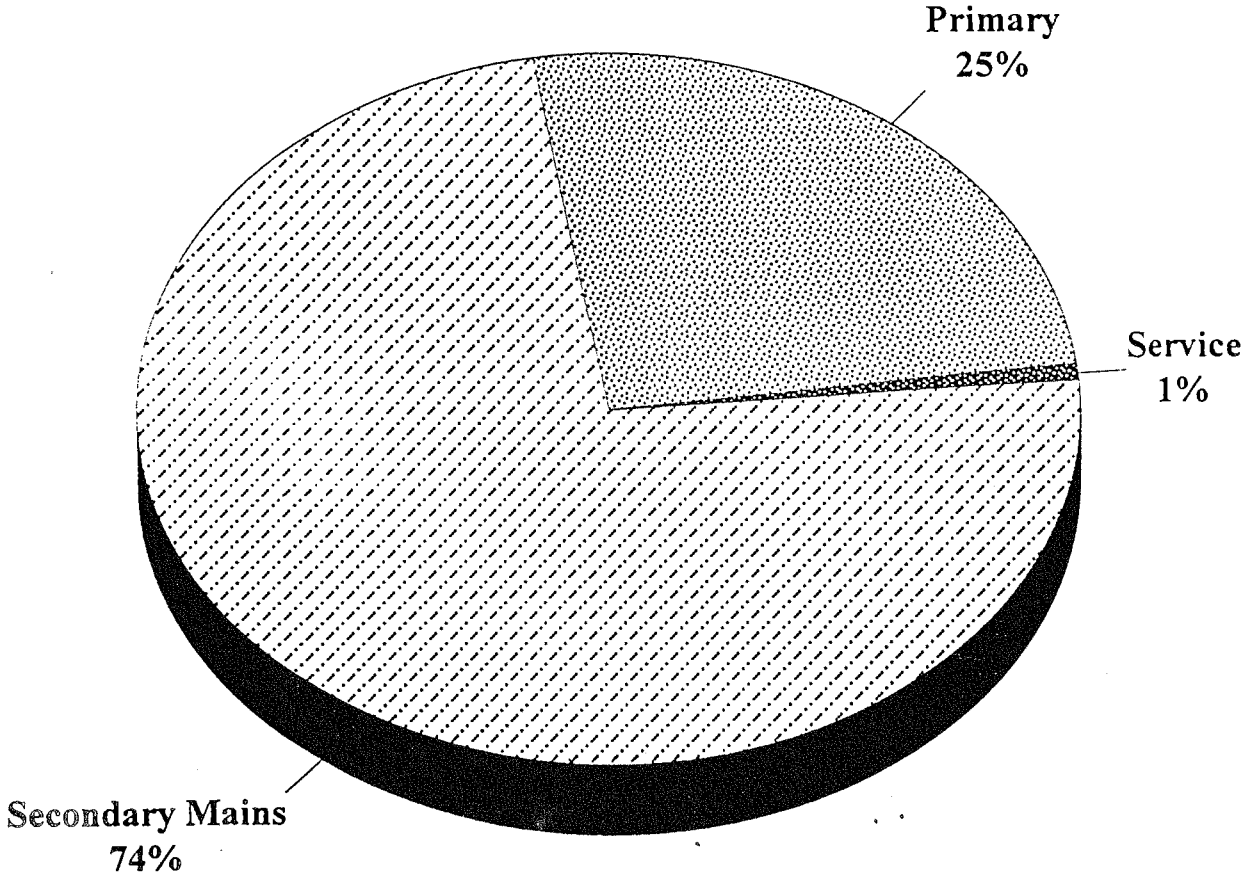
To specifically relate types of cable to types of underground structures, a database in Con Edison's Brooklyn district was accessed. This database indicated that manholes represent more than half of all the structures in Brooklyn that contain lead-jacketed cable. This is illustrated in Figure 6-7.

All transformer vaults, three-quarters of the manholes, and a small percentage of the service boxes in Brooklyn have lead-jacketed cable (Table 6-4). Structures in which there is lead-jacketed cable represent approximately one-third of the total number of structures in Brooklyn.

Table 6-4
Number of Structures Containing Lead-Jacketed Cable in Brooklyn

Structure	Total Number	Number Containing Lead-Jacketed Cable	Percentage of Structures Containing Lead-Jacketed Cable
Service Boxes	48,630	6,140	13%
Manholes	21,848	16,400	75%
Transformers	5,700	5,700	100%
Total	76,178	28,240	37%

The information in Table 6-4 can be used to determine which structures have the greatest likelihood of containing high-lead solids. Other structural factors contributing to high levels of lead solids (e.g., presence of leaded joints, former presence lead-jacketed cable) cannot be assessed.



Approximate total miles of underground cable: 66,400

Figure 6-3
SUMMARY OF TYPES OF CABLE IN CON EDISON'S UNDERGROUND SYSTEM

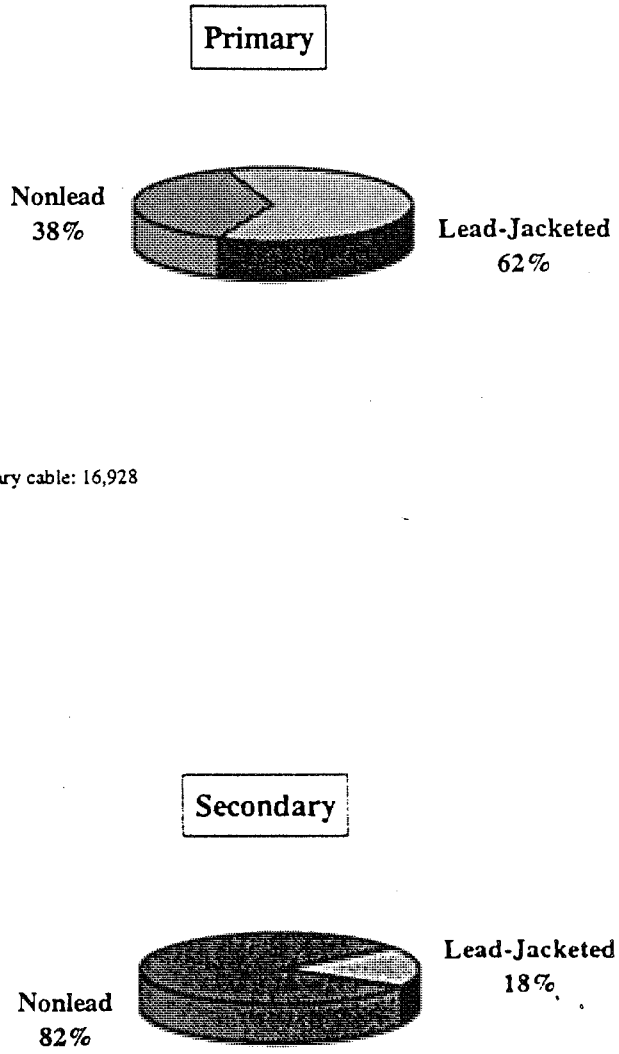
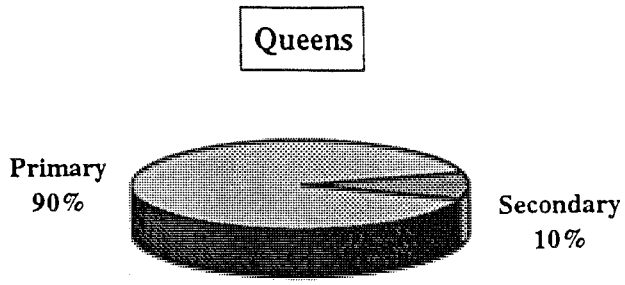
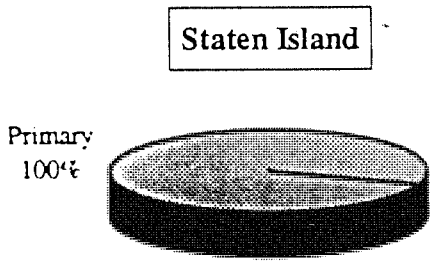


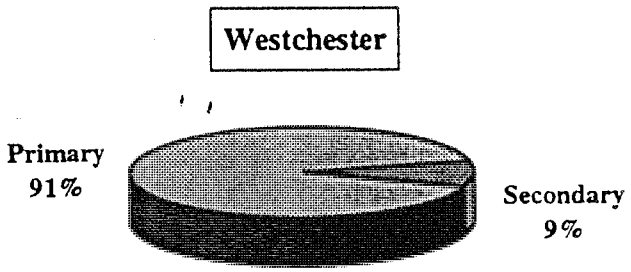
Figure 6-4
SUMMARY OF LEAD-JACKETED CABLE BY TYPE OF CABLE



Total miles of lead-jacketed cable: 2,808

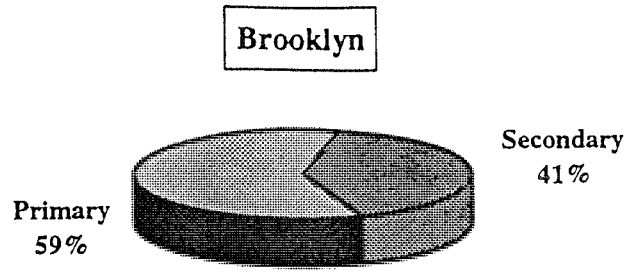


Total miles of lead-jacketed cable: 123

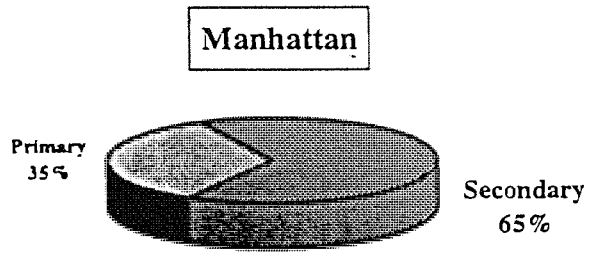


Total miles of lead-jacketed cable: 1,127

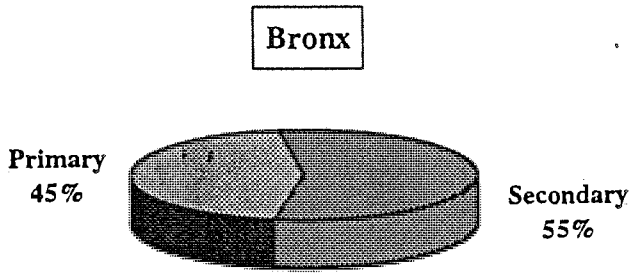
Figure 6-5
SUMMARY OF LEAD-JACKETED CABLE BY TYPE:
QUEENS, STATEN ISLAND, AND WESTCHESTER



Total miles of lead-jacketed cable: 5,082

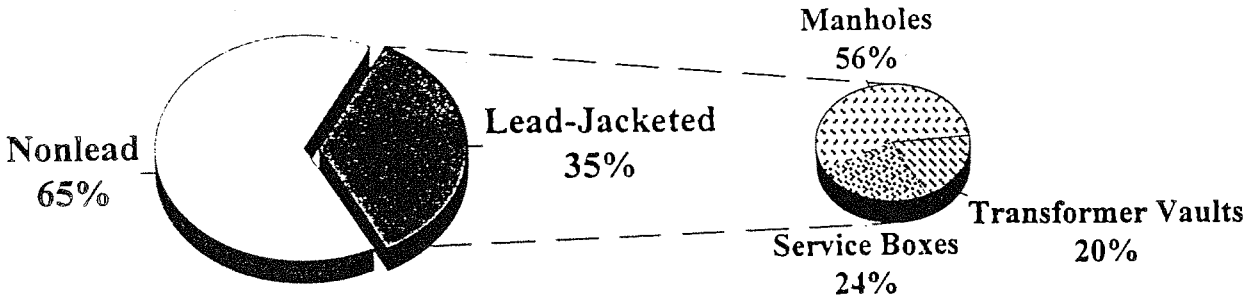


Total miles of lead-jacketed cable: 7,289



Total miles of lead-jacketed cable: 2,952

Figure 6-6
SUMMARY OF LEAD-JACKETED CABLE BY TYPE:
BROOKLYN, MANHATTAN, AND BRONX



Approximate total number of underground structures: 72,000

Figure 6-7
SUMMARY OF UNDERGROUND STRUCTURES WITH LEAD-JACKETED CABLE IN BROOKLYN

Analysis of samples taken in 1994 and knowledge regarding the presence of lead in the system indicate that waste can be minimized in the following areas:

- Although transformer vaults generally contain lead-jacketed cable, analytical results indicate that concentrations of TCLP lead are below the regulatory limit.
- Solid phase taken from service boxes was likely to fall within the regulatory limit for TCLP lead.
- The geographical location of the underground structure may be a factor in the likelihood that lead will be in the solids.
- Structures in which there is no lead-jacketed cable contained solids with concentrations below the TCLP regulatory limit for lead.

To confirm the potential for waste segregation and to supplement the data, further sampling of the solid phase in underground structures was performed in 1995. The results of this sampling are described in Section 7. Conclusions regarding waste minimization are presented in Section 8.

6.4 Potential Sources of Contamination in Liquid-Phase Samples

As mentioned previously, copper, lead, TPH, and PCBs were identified as potential contaminants in the liquid phase in underground structures. Potential sources of these constituents are discussed in this section. Although TSSs are not a contaminant of concern, the Facility Sewer Discharge study revealed that concentrations of metals and PCBs are related to TSS, so TSS is discussed as well.

6.4.1 TSS

Structural

Service boxes tended to have higher TSS concentrations than other types of structures sampled. Because service boxes typically are smaller than manholes and transformer vaults, less water can accumulate in them. As noted in Section 5, TSS concentrations in liquid-phase samples tended to decrease with increasing liquid level in the structure.

Operational

No correlation was observed between TSS concentrations and operational parameters.

Environmental

Environmental factors that could affect the TSS concentrations in liquid-phase samples include depth of water and source of water (e.g., from stormwater run-off or infiltration). Differences in TSS concentrations among districts were attributed to the type of structure that was sampled rather than to the district the structure is in. For example, the average TSS concentration in liquid-phase samples from Queens was 210 mg/L, far below the 5,000 mg/L

in samples collected from Brooklyn. However, four of the five liquid-phase samples collected in Queens were from transformer vaults, whereas no transformer vaults were sampled in Brooklyn. A similar analogy can be made for liquid-phase samples collected in Manhattan.

In summary, structural factors and the depth of liquid in the structures appear to be the primary influences on the concentration of TSS in the liquids.

6.4.2 Lead

Structural

Of the 27 liquid-phase samples collected, 15 were from structures in which there is lead-jacketed cable. Seven liquid-phase samples had concentrations higher than the City sewer-use regulatory limit of 2.0 mg/L. Six of these were collected from structures containing lead-jacketed cable; this corresponds to 40 percent of the structures that contain lead-jacketed cable.

Five of the liquid-phase samples with concentrations of lead higher than the sewer-use limit were from services boxes, and one was from a manhole. As noted in subsection 6.4.1, TSS concentrations were higher in service boxes than in the other types of structures sampled. Therefore, the type of structure and the presence of lead within the structure are considered factors contributing to the presence of lead in the liquids.

Operational

According to field interviews, all structures that had lead concentrations higher than the sewer-use regulatory level were going to have cables removed and replaced. No information on previous maintenance performed on the structures was available.

Environmental

Of the seven samples that exceeded the sewer-use regulatory level for lead, four were from Brooklyn, two were from Manhattan, and one was from Queens. None of the liquid-phase samples from the Bronx exceeded the sewer-use limit for lead.

Although there appears to be some correlation between location and distribution of lead, the presence of lead is believed to be attributable to structural and operational factors.

In summary, the presence of lead-jacketed cable and operations on the lead-jacketed cable are the factors that most influence lead concentrations in liquids.

6.4.3 Copper

Structural

Only two samples exceeded the sewer-use limit for copper. Both of the samples were collected from service boxes, which were found to have higher TSS concentrations than the other types of structures sampled. The samples also exceeded the sewer-use limits for lead.

Operational

According to field interviews, lead-jacketed cables were going to be removed and replaced in all structures that produced samples with lead concentrations higher than the sewer-use regulatory level. No information on operations on copper-related cable or equipment or previous maintenance performed on those structures was available.

Environmental

The average concentrations of copper in liquid-phase samples were higher in Brooklyn and Manhattan by one to two orders of magnitude than in samples collected in Queens and the Bronx. Nevertheless, the concentrations are more likely related to the type of structure sampled (and thus the TSS concentration in the sample) than to geographic location.

No conclusions can be drawn about concentrations of copper in the liquids within the structures.

6.4.4 TPH

Structural

Of the liquid-phase samples that had concentrations higher than the sewer-use limit for TPH, two were from manholes, five were from service boxes, and two were from transformer vaults. No correlations were observed between the type of structure sampled or the type of equipment in the structure and the TPH concentration in the liquid-phase samples.

Operational

Liquid-phase samples were collected from two structures that had not been cleaned by flush trucks because of the presence of oil. These samples had relatively low concentrations of TPH (5.4 mg/L and 37 mg/L). The maximum observed TPH concentration was 580 mg/L. As described in Section 4, no solid-phase samples were collected from these two structures, so relative concentrations cannot be compared.

Environmental

TPH concentrations higher than 50 mg/L were observed in the four districts sampled. The oil in the structures could be coming from Con Edison's transmission system or it could be used

motor oil from outside sources. The odor of motor oil was noted in several samples that had been collected from structures that have holes in their covers.

6.4.5 PCBs

Structural

No PCBs were detected in liquid-phase samples collected from service boxes, but PCBs were detected in some solid-phase samples from services boxes. PCBs were detected in liquid-phase samples collected in manholes and transformer vaults. These structure types typically house primary cable, which sometimes contains oil with PCBs.

Operational

No correlations could be drawn between operations performed in the structures and PCBs in the liquids.

Environmental

None of the liquid-phase samples collected in Queens had detectable concentrations of PCBs. However, PCBs were detected in solid-phase samples collected from structures in Queens. No external source of the PCBs in the structures could be identified.

No conclusions can be drawn about the source of PCBs in the liquids.

Section 7

Waste Segregation Sampling

Opportunities to minimize generation of hazardous waste through waste segregation were identified on the basis of the limited underground structure sampling performed in 1994. Additional underground structures were sampled in 1995 to better evaluate opportunities to minimize hazardous waste generation through segregation. This section summarizes the sampling program and presents the results of both the 1994 and 1995 solid-phase sampling for toxicity characteristic leaching procedure (TCLP) lead as they relate to waste segregation.

7.1 Waste Segregation Sampling Approach

In response to the waste segregation opportunities identified during the 1994 sampling effort, the following approach was developed and implemented to obtain additional data on TCLP lead from solid-phase samples. All samples were collected and analyzed in accordance with the NYSDEC-approved Phase I and II Work Plan (CH2M HILL, January 1994), which includes field a field sampling plan, quality assurance project plan, standard operating procedures, and health and safety plan.

The CH2M HILL sampling team spent 2 days in Staten Island and Westchester and 3 days in Queens collecting samples of solid phase from an equal number of service boxes, transformer vaults, and manholes. The CH2M HILL sampling team also spent 2 days in Brooklyn and the Bronx, and 3 days in Manhattan collecting samples of solid phase from an equal number of service boxes and transformer vaults. Because opportunities for segregating solid-phase material from manholes located in Brooklyn, Manhattan, and the Bronx were limited, manholes were not sampled in these districts.

Two hundred structures were sampled during the sampling period, and broad geographic coverage was achieved in each area. Sampling locations for Staten Island, Westchester, Queens, Brooklyn, the Bronx, and Manhattan are shown in Figures 7-1 through 7-6, respectively, at the end of this section. Because the focus of the sampling was on minimizing hazardous waste-specifically, samples were analyzed only for TCLP lead.

Two street sweep samples were collected near structures that are located below major bridges to further investigate potential environmental sources of lead. The street sweep samples also were analyzed for TCLP lead.

7.2 Results

This subsection summarizes the results of the sampling completed in 1995. Where applicable, the results of the 1994 Phase I sampling effort also are included in the discussion. Tabular summaries of the 1995 sampling, including date and time of sample collection, are presented in Appendix H.

7.2.1 Staten Island

Structures in Staten Island were sampled on February 23 and 24, 1995. Samples of solid phase were collected from 9 service boxes, 8 manholes, and 10 transformer vaults. No structures in Staten Island were sampled in 1994.

Concentrations of TCLP lead in the samples of solid phase ranged from no detection to 27 mg/L. Ninety percent of the samples of solid phase collected in Staten Island had concentrations of TCLP lead below the regulatory level. Of the structures sampled, solid phase from 89 percent of services boxes, 75 percent of the manholes, and 100 percent of the transformer vaults had TCLP lead concentrations below the TCLP regulatory level.

7.2.2 Westchester County

Structures in Westchester County were sampled on February 16 and 17, 1995. Samples of solid-phase were collected from six service boxes, six manholes, and six transformer vaults. Structures in Westchester were not sampled in 1994.

Concentrations of TCLP lead in the samples of solid phase ranged from no detection to 450 mg/L. Over three-quarters of the samples of solid phase had concentrations of TCLP lead below the TCLP regulatory level. Of the structures sampled, solid phase from 100 percent of the service boxes, 50 percent of the manholes, and 83 percent of the transformer vaults had concentrations of lead that were below the TCLP regulatory level.

7.2.3 Queens

Structures in Queens were sampled in May 1994 and from March 6 through March 8, 1995. Samples of solid phase were collected from a 16 service boxes, 18 manholes, and 22 transformer vaults.

Concentrations of TCLP lead in the samples of solid phase ranged from no detection to 370 mg/L. Approximately 80 percent of the samples of solid-phase collected in Queens had concentrations of TCLP lead below the TCLP regulatory level. Of the structures sampled, solid phase from 94 percent the service boxes, 50 percent of the manholes, and 95 percent of the transformer vaults had concentrations of TCLP lead below the TCLP regulatory level.

7.2.4 Brooklyn

Structures in Brooklyn were sampled in June 1994 and on March 20 and 21, 1995. Samples of solid phase were collected from 24 service boxes, 6 manholes, and 21 transformer vaults. Because opportunities for segregating solid phase from manholes in Brooklyn were limited, additional samples were not collected.

Concentrations of TCLP lead in the samples of solid-phase ranged from no detection to 110 mg/L. Ninety percent of the samples of solid-phase collected had concentrations of TCLP lead below TCLP regulatory level. Of the structures sampled, solid phase from 96 percent of the service boxes, 50 percent of the manholes, and 95 percent of the transformer vaults had concentrations of TCLP lead below the TCLP regulatory level.

7.2.5 Manhattan

Structures in Manhattan were sampled in June 1994 and March 20 through 22, 1995. Samples of solid phase were collected from 19 service boxes, 3 manholes, and 16 transformer vaults. Because opportunities for segregating solid phase from manholes in Manhattan were limited, additional samples were not collected.

Concentrations of TCLP lead in the samples of solid-phase ranged from no detection 720 mg/L. Eighty-seven percent of the samples of solid-phase collected in Manhattan had concentrations of TCLP lead below the TCLP regulatory level. Of the structures sampled, solid phase from 74 percent of the service boxes, and 100 percent had concentrations of TCLP lead below the TCLP regulatory level.

7.2.6 The Bronx

Structures in the Bronx were sampled in July 1994 and on March 23 and 24, 1995. Samples of solid phase were collected from 20 service boxes, 5 manholes, and 18 transformer vaults. Because opportunities for segregating solid phase from manholes in Bronx were limited, additional samples were not collected.

Concentrations of TCLP lead in the samples of solid-phase ranged from no detection to 5.6 mg/L. Ninety-one percent of the samples of solid-phase collected in the Bronx had concentrations of TCLP lead below the TCLP regulatory level. Of the structures sampled, solid phase from 95 percent of the service boxes, 40 percent of the manholes, and 100 of the transformer vaults had solid phase with TCLP lead concentrations below the TCLP regulatory level.

7.2.7 Street Sweep Samples

A street sweep sample was collected in 1995 near the Manhattan Bridge in Brooklyn had a TCLP lead concentration of 45 mg/L. The concentration of TCLP in the sample of solid phase collected from a structure located near the bridge was below the TCLP regulatory level.

Another street sweep sample collected near the Tri-Borough Bridge in Queens had no detectable TCLP lead. Likewise, no TCLP lead was detected in the solid phase collected from the service box and transformer vaults near the bridge. The TCLP lead concentration in solid phase collected from the manhole near the bridge was 1.1 mg/L.

The TCLP lead results for the street sweep samples confirm the previous conclusion that the lead in solid-phase taken from underground structures probably is not coming from environmental sources, but rather from structural or operational sources.

7.3 Waste Segregation Opportunities

This subsection presents a summary of the solid-phase data evaluation and describes opportunities for waste segregation and hazardous waste minimization.

7.3.1 Data Evaluation Summary

Two hundred and thirty-three samples of solid phase were collected from underground structures and analyzed for TCLP lead. Table 7-1 summarizes analytical results by structure type. Statistical analysis of TCLP lead data for each structure type (regardless of geographical location) indicated a high probability that the average TCLP lead concentration in solid-phase material from transformer vaults would fall below the TCLP regulatory level for lead.

Table 7-1
Summary of Solid-Phase TCLP Lead Results by Structure Type

Structure Type	Number Sampled	Number Below 5 mg/L Limit	Percentage Below 5 mg/L Limit
Service Boxes	93	84	90%
Manholes	47	27	57%
Transformer Vaults	93	90	97%

Table 7-2 shows the TCLP lead results by geographical area and structure type. TCLP lead data for each structure type within each location was evaluated both statistically and based upon the distribution of lead-jacketed cable in the system. This analysis indicated that the average TCLP lead concentration in the following structures and areas has a high probability of being below the TCLP regulatory limit:

- Service boxes in Brooklyn, Queens, Westchester, Staten Island, and the Bronx
- Transformer vaults in all districts

Σ Manholes = 47
20 failed

Table 7-2
Summary of Solid-Phase TCLP Lead Results by Location and Structure Type

District	Structure Type	Number Sampled	Number Below 5 mg/L Limit	Percentage Below 5 mg/L Limit
Staten Island	Service Boxes	8	7	87%
	Manholes	9	7	78%
	Transformer Vaults	10	10	100%
Westchester	Service Boxes	6	6	100%
	Manholes	6	3	50%
	Transformer Vaults	6	5	83%
Queens	Service Boxes	16	15	94%
	Manholes	18	9	50%
	Transformer Vaults	22	21	95%
Brooklyn	Service Boxes	24	23	96%
	Manholes	6	3	50%
	Transformer Vaults	21	20	95%
Manhattan	Service Boxes	19	14	74%
	Manholes	3	3	100%
	Transformer Vaults	16	16	100%
Bronx	Service Boxes	20	19	95%
	Manholes	5	2	40%
	Transformer Vaults	18	18	100%
	TOTALS	***233***	***201***	***86%***

On the basis of these results, the solid-phase material taken from these structures would be segregated from other solid-phase material, when feasible. Seventy-four percent of the Manhattan service boxes contained solid material that did not exceed the TCLP lead limit. While this is somewhat less than the percentages in other districts (e.g., 94% in Queens), this material also may be segregated. Although the solid phase from these structures will generally not exceed the regulatory limit for TCLP lead, a segregation and confirmatory evaluation program will be developed during Phase III (Final Design).

The presence of solid-phase material in which TCLP lead concentrations were greater than the TCLP lead regulatory level is caused primarily by structural and operational factors, rather than by environmental factors. Structural information for the 200 structures sampled in 1995 was compiled on the basis of upon field observations and subsequent record searches. Tabular summaries for these structures by district are presented in Appendix J. These summaries were combined with the structural information obtained for structures sampled in 1994.

A summary of the number of structures identified as containing lead-jacketed cable or splices and the number of those structures containing solids below the TCLP lead regulatory level is presented in Table 7-3. In general, samples of solid-phase with TCLP lead concentrations greater than the TCLP regulatory level were collected from structures that were identified as having lead-jacketed cable or lead joints. However, 89 percent of service boxes and 97 percent of the transformers vaults that were identified as containing lead equipment contained solid-phase material with TCLP lead concentrations below the regulatory level.

Table 7-3
Structures Containing Equipment with Lead, and TCLP Lead Results

Structure Type	Number Containing Equipment with Lead	Number of Corresponding Samples Below 5.0 mg/L Limit	Percentage of Samples Below 5.0 mg/L Limit
Service Boxes	36	32	89%
Manholes	32	12	38%
Transformer Vaults	63	61	97%

7.3.2 Recommendations

When it is feasible, solid-phase material from transformer vaults and service boxes should be segregated from other solid-phase material. Although solid-phase from these structures will generally not exceed the regulatory limit for TCLP lead, a segregation and confirmatory evaluation program will be developed during Phase III (Final Design).

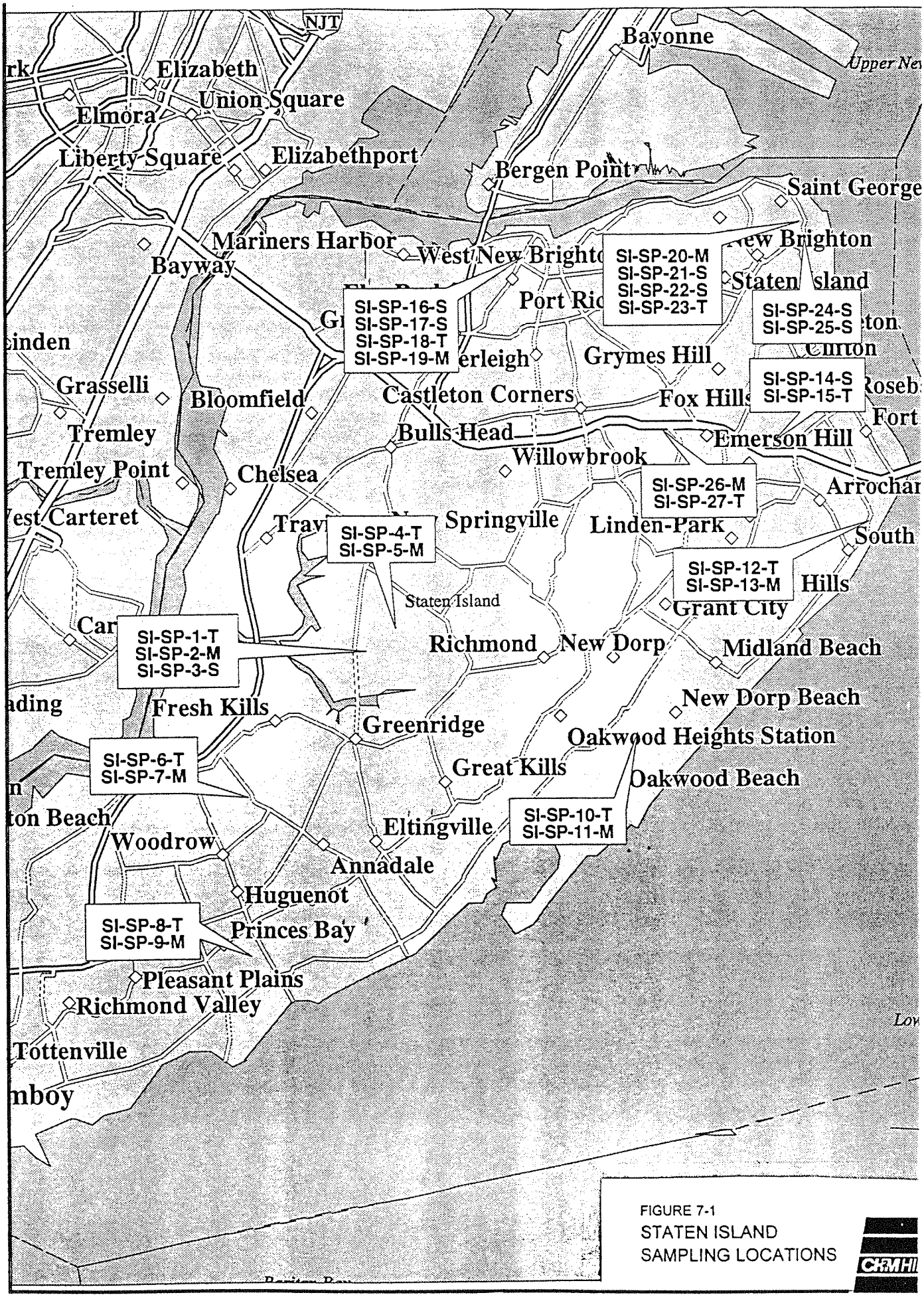


FIGURE 7-1
STATEN ISLAND
SAMPLING LOCATIONS

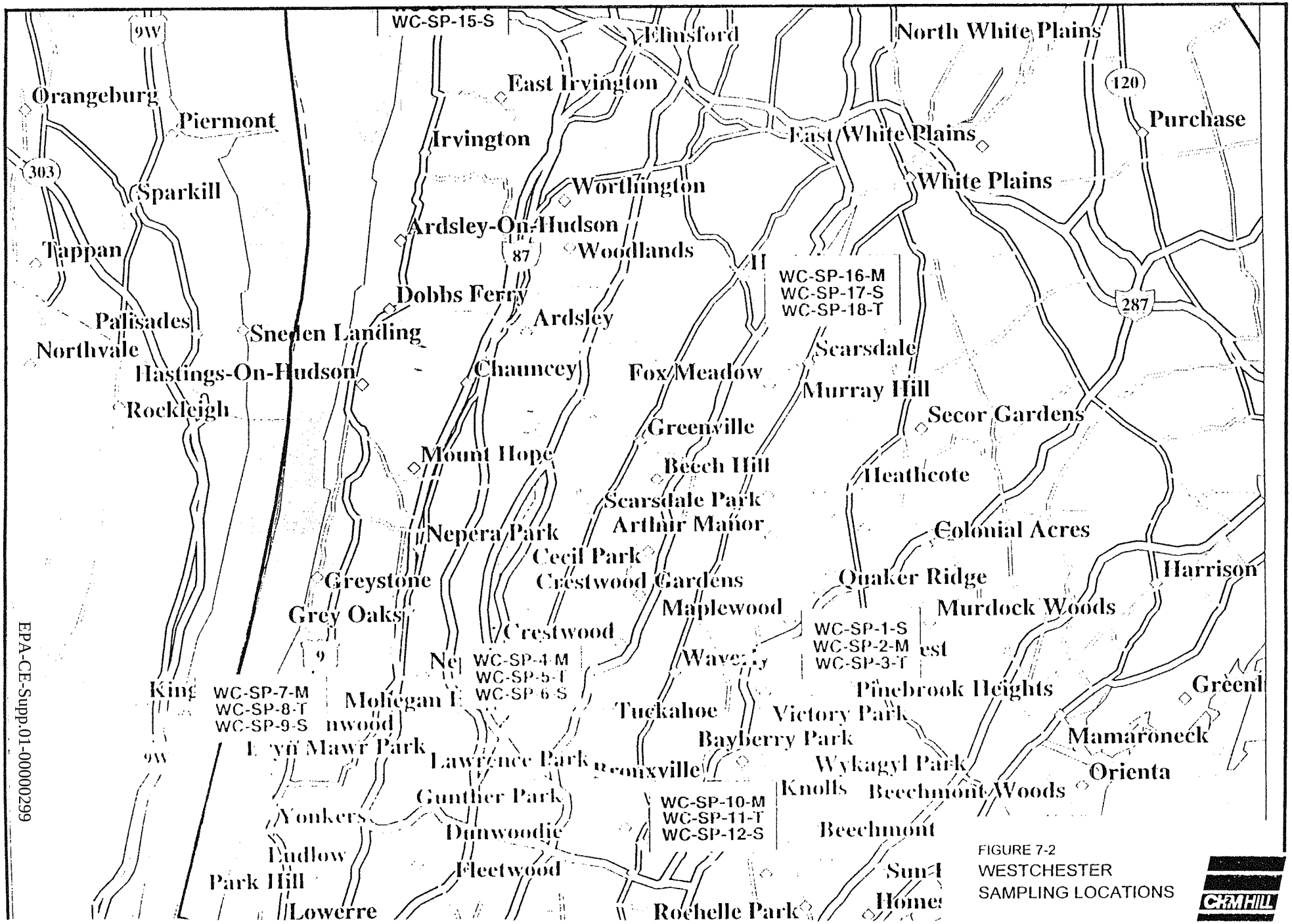


FIGURE 7-2
WESTCHESTER
SAMPLING LOCATIONS

CH2MHILL

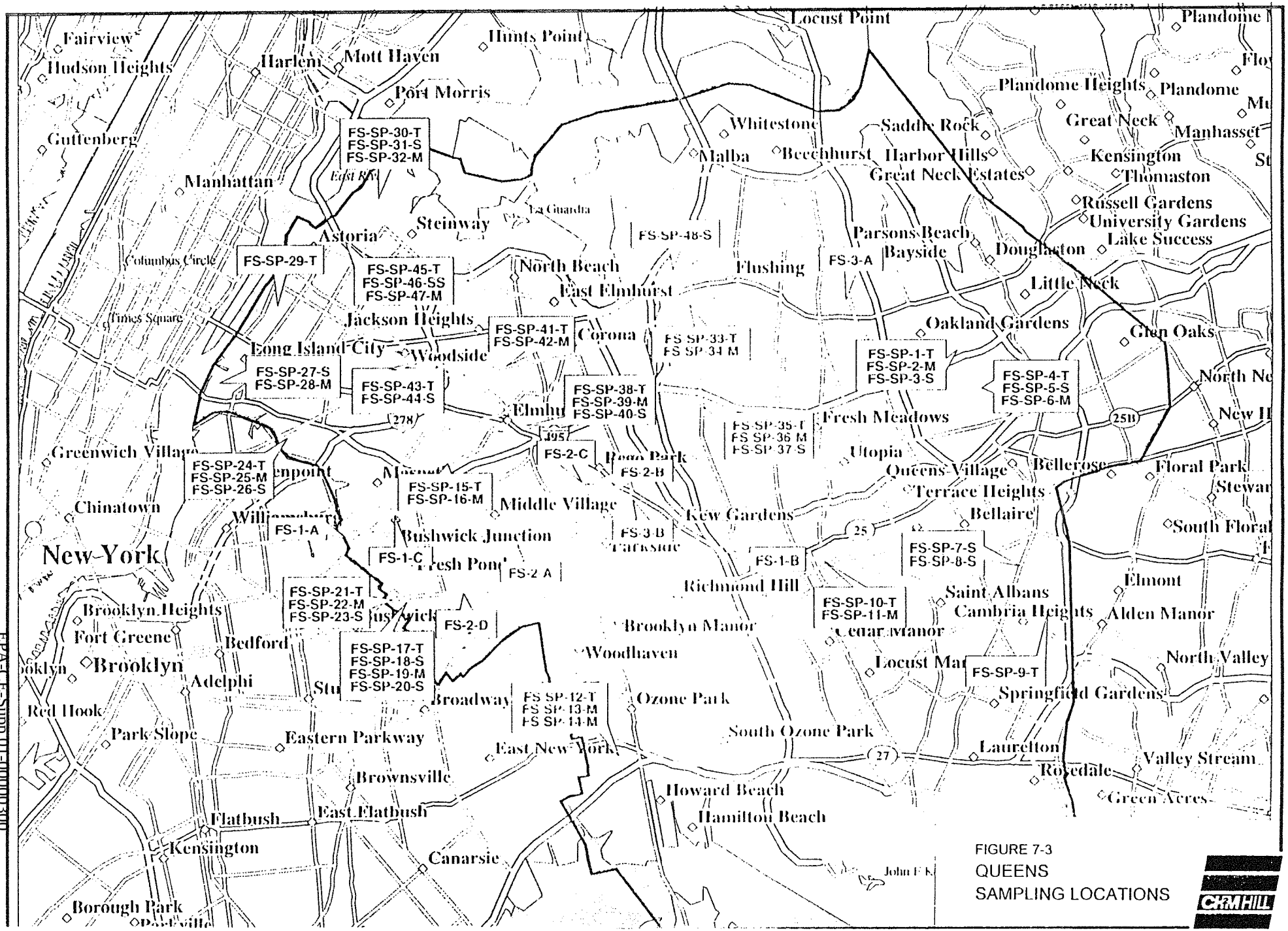


FIGURE 7-3
QUEENS
SAMPLING LOCATIONS

CH2MHILL

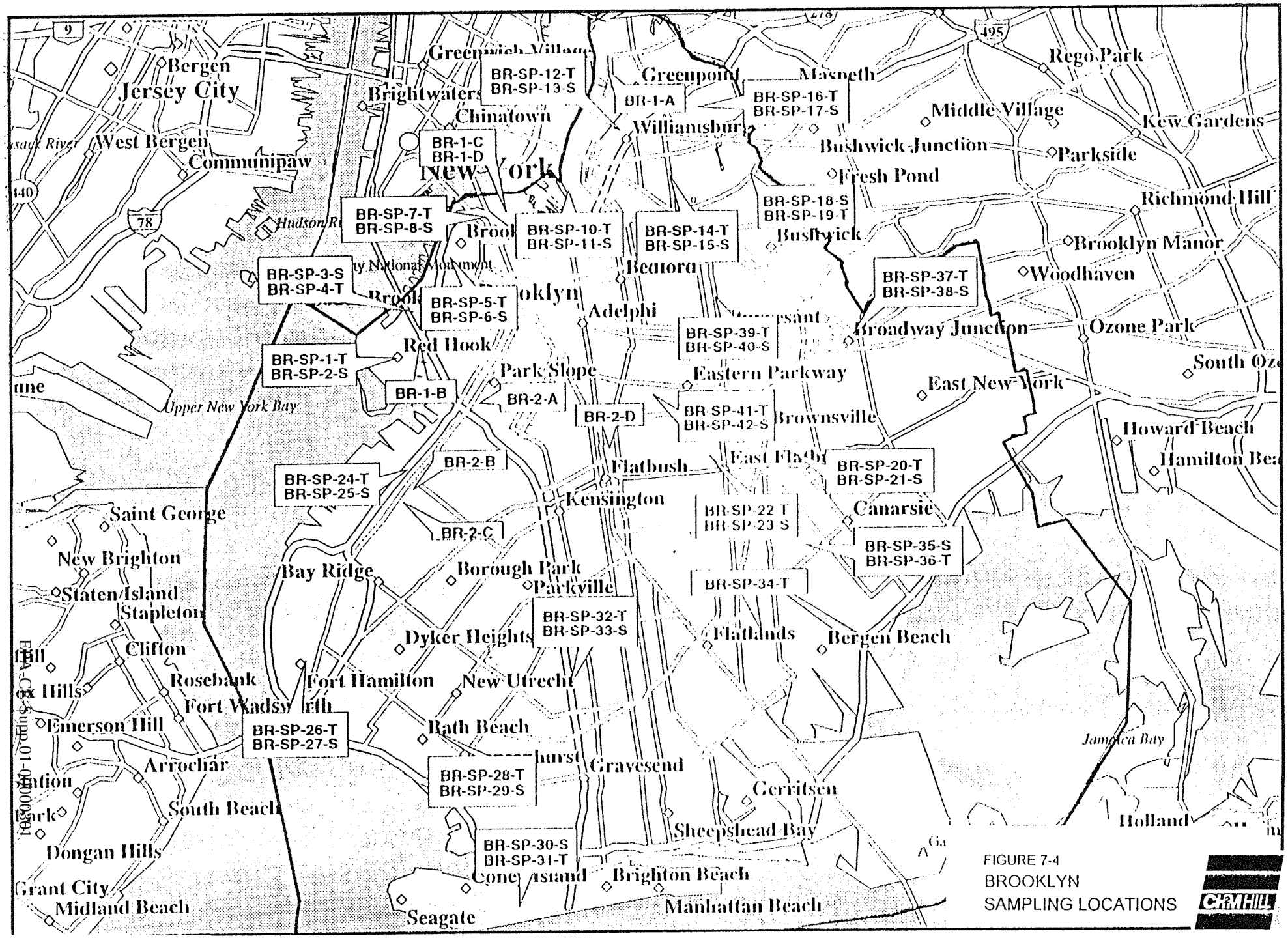


FIGURE 7-4
BROOKLYN
SAMPLING LOCATIONS

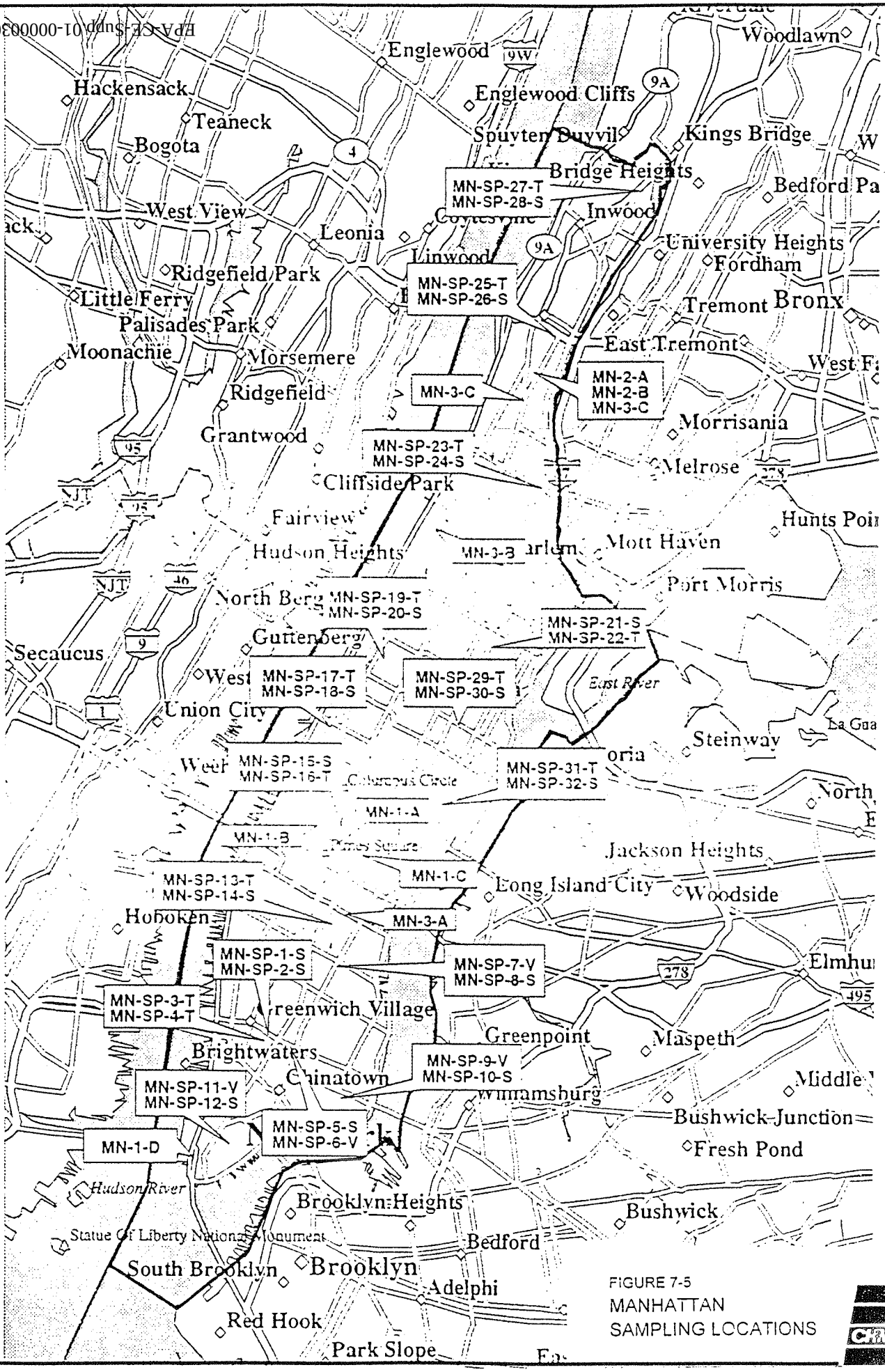


FIGURE 7-5
MANHATTAN
SAMPLING LOCATIONS

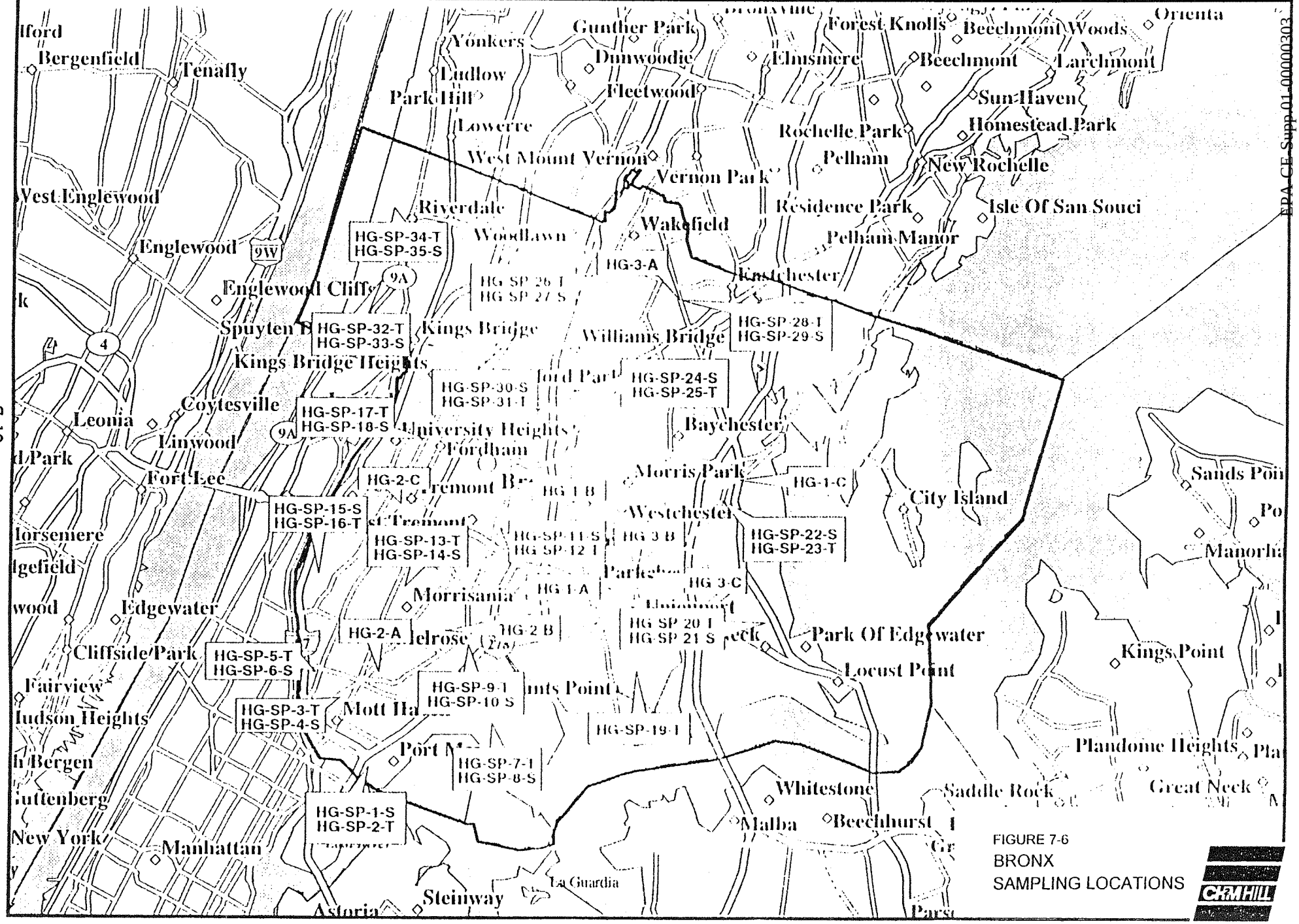


FIGURE 7-6
BRONX
SAMPLING LOCATIONS

CH2MHILL

7-12

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Appendix A
Field Measurements and Observations

Queens Liquid-Phase and Overflow-Water Sample Field Measurements and Observations						
Sample ID	**Date**	**Approx Depth (ft)**	**Evidence of Infiltration?**	**pH**	**Temperature (°C)**	**Observations**
Liquid Phase						
FS-LP-1-A	26-May-94	1	Yes	6.9	23.5	Slight sheen
FS-LP-1-B	26-May-94	1		6.8	21.1	
FS-LP-1-C	26-May-94	1-2		7.1	20.6	
FS-LP-2-A	27-May-94	4	Yes	6.1	24.4	Oily odor. Sheen and brown film on top.
FS-LP-2-D	27-May-94	1		6.9	20.7	Slight Sheen. Clear
Truck Overflow						
FS-OF-2-A	27-May-94	N/A		6	16.2	Oily sheen.
FS-OF-3-B	29-May-94	N/A		6.2	24.9	
N/A Not Applicable						

Brooklyn

Liquid-Phase and Overflow-Water Sample Field Measurements and Observations

Sample ID	Date	Approx Depth (ft)	Evidence of Infiltration?	pH	Temperature (°C)	Observations
Liquid Phase						
BR-LP-1-B	1-Jun-94	0.083 - 0.167		11.6	18	pH high due to a degreaser used during servicing. Solder in bottom of structure.
BR-LP-1-C	1-Jun-94	0.083		6.4	22.7	
BR-LP-2-A	2-Jun-94	3	Yes	5.4	17	Oily sheen, some household garbage present.
BR-LP-2-B	2-Jun-94	2.5	Yes	8.6	18.9	Very turbid. Only a small puddle of water present./
BR-LP-2-C	2-Jun-94	3.5	Yes	7.2	21	Slight oil sheen and odor
BR-LP-2-D	2-Jun-94	0.5		6.45	21.5	Possibly free phase oil
BR-LP-3-A	3-Jun-94	1		6.1	20	Oily sheen
BR-LP-3-B	3-Jun-94	0.5 - 0.67		6.5	25.9	Oily sheen with floating particles
Truck Overflow						
BR-OF-3-B	2-Jun-94	N/A		7	25.7	Oily sheen, Brown

N/A Not Applicable

Manhattan Liquid-Phase and Overflow-Water Sample Field Measurements and Observations						
Sample ID	**Date**	**Approx Depth (ft)**	**Evidence of Infiltration?**	**pH**	**Temperature (°C)**	**Observations**
Liquid Phase						
MN-LP-1-A	8-Jun-94	5	Yes	6.2	26.1	Oily sheen. Flush truck will not pick up due to oil.
MN-LP-1-C	8-Jun-94	4	Yes	6.6	16.3	
MN-LP-2-A	9-Jun-94	0.5		5.8	19.9	Sheen. Raw sewage odor.
MN-LP-2-B	9-Jun-94	0.5		5.4	23	Slight sheen. Raw sewage odor.
MN-LP-2-C	9-Jun-94	4.5		6.08	24.3	Oily sheen.
MN-LP-3-A	10-Jun-94	>1		7.4	39.6	High oil content.
MN-LP-3-B	10-Jun-94	0.25	Yes	12	19.6	Cloudy
MN-LP-3-C	10-Jun-94	1		8	28.1	Slight organic odor; sheen; brown.
Truck Overflow						
MN-OF-1-C	8-Jun-94	N/A		6.1	19.2	
MN-OF-2-C	9-Jun-94	N/A		6.6	19.3	Raw sewage odor. Sheen.
N/A Not Applicable						

Bronx Liquid-Phase and Overflow-Water Sample Field Measurements and Observations						
Sample ID	**Date**	**Approx Depth (ft)**	**Evidence of Infiltration?**	**pH**	**Temperature (°C)**	**Observations**
Liquid Phase						
HG-LP-1-A	12-Jul-94	3		5.8	27.1	Sewage and "rotting garbage" odor.
HG-LP-1-B	12-Jul-94	4	Yes	6.1	25	
HG-LP-2-A	14-Jul-94	no data		5.8	26.2	No odor.
HG-LP-2-B	14-Jul-94	0.5		6.9	26.3	Slight sewage odor. Musty.
HG-LP-2-C	14-Jul-94	4		7	24.9	Slight sheen. Sewage odor.
HG-LP-3-A	15-Jul-94	2.5		7.3	30.5	Slight sheen. Slightly turbid.
Truck Overflow						
HG-OF-1-B	12-Jul-94	N/A		6.3	25	Dark very turbid. Sewage and "rotting garbage odor".
HG-OF-2-A	14-Jul-94	N/A		6.5	28.4	Started pumping clear. Ended very turbid.
HG-OF-2-C	14-Jul-94	N/A		7	28.5	Very turbid. Brown.
HG-OF-3-A	15-Jul-94	N/A		7.3	21.3	
N/A Not Applicable						

Appendix B
Analytical Results for Solid-Phase and Street Sweep Samples

Solid-Phase and Street Sweep Samples - Inorganic Analytical Results
Queens

Solid-Phase Samples					
Sample ID	Sampling Time	Lead mg/kg	TCLP Lead mg/l	TPH mg/kg	Percent Solids
May 26, 1994					
FS-SP-1-A	9:40 AM	450	1.3	1,600	69
FS-SP-1-B	11:30 AM	1,900	0.64	470	49
FS-SP-1-C	1:20 PM	640	ND	1,100	39
May 27, 1994					
FS-SP-2-A	9:10 AM	390	ND	8,800	44
FS-SP-2-B	11:05 AM	450	ND	53,000	82
FS-SP-2-C	1:05 PM	260	2.5	230	91
FS-SP-2-D	2:30 PM	450	ND	970	72
May 31, 1994					
FS-SP-3-A	10:30 AM	97	ND	1,000	66
FS-SP-3-B	2:45 PM	11,000	ND	200	82

Street Sweep Samples					
Sample ID	Sampling Time	Lead mg/kg	TCLP Lead mg/l	TPH mg/kg	Percent Solids
May 26, 1994					
FS-SS-1-A	9:20 AM	1,500	N/A	400	76
FS-SS-1-B	11:45 AM	590	N/A	4,200	77
FS-SS-1-C	1:25 PM	97	N/A	1,300	80
May 27, 1994					
FS-SS-2-A	9:15 AM	230	N/A	1,400	58
FS-SS-2-B	11:25 AM	460	N/A	4,600	94
FS-SS-2-C	1:15 PM	260	N/A	1,900	89
FS-SS-2-D	2:45 PM	440	N/A	3,800	83
May 31, 1994					
FS-SS-3-A	10:40 AM	93	N/A	1,600	93
FS-SS-3-B	2:30 PM	430	N/A	2,700	89

ND Analyzed for but not detected
N/A Not Applicable. Corresponding solid phase sample was < 5.0 mg/l for TCLP lead. TCLP lead concentrations > 5.0 mg/l (regulatory level) are shaded

Solid-Phase Samples - PCB Analytical Results
Queens

Sample ID	Sampling Time	Arochlor 1016 mg/kg	Arochlor 1221 mg/kg	Arochlor 1232 mg/kg	Arochlor 1242 mg/kg	Arochlor 1248 mg/kg	Arochlor 1254 mg/kg	Arochlor 1260 mg/kg	Total PCBs mg/kg
May 26, 1994									
FS-SP-1-A	9:40 AM	ND	ND	ND	ND	ND	0.5	0.26	0.76
FS-SP-1-B	11:30 AM	ND	ND	ND	ND	ND	ND	2.9	2.9
FS-SP-1-C	1:20 PM	ND	ND	ND	ND	ND	ND	0.11	0.11
May 27, 1994									
FS-SP-2-A	9:10 AM	ND	ND	ND	ND	ND	0.1	0.079	0.179
FS-SP-2-B	11:05 AM	ND	ND	ND	ND	ND	ND	6.5	6.5
FS-SP-2-C	1:05 PM	ND	ND	ND	ND	ND	0.024	0.061	0.085
FS-SP-2-D	2:30 PM	ND	ND	ND	ND	ND	0.12	0.084	0.204
May 31, 1994									
FS-SP-3-A	10:30 AM	ND	ND	ND	ND	ND	0.22	0.13	0.35
FS-SP-3-B	2:45 PM	ND	ND	ND	ND	ND	1.1	0.062	1.162

ND Analyzed for but not detected

Solid-Phase and Street Sweep Samples - Asbestos Results
Queens

Solid-Phase Samples					
Sample ID	Sampling Time	Asbestos			
		Chrysotile	Amosite	Crocidolite	Other
May 26, 1994					
FS-SP-1-A	9:40 AM	ND	ND	ND	ND
FS-SP-1-B	11:30 AM	ND	ND	ND	ND
FS-SP-1-C	1:20 PM	<1%	ND	ND	ND
May 27, 1994					
FS-SP-2-A	9:10 AM	<1%	ND	ND	ND
FS-SP-2-B	11:05 AM	<1%	ND	ND	ND
FS-SP-2-C	1:05 PM	ND	ND	ND	ND
FS-SP-2-D	2:30 PM	ND	ND	ND	ND
May 31, 1994					
FS-SP-3-A	10:30 AM	ND	ND	ND	ND
FS-SP-3-B	12:45 PM	ND	ND	ND	ND

Street Sweep Samples					
Sample ID	Sampling Time	Asbestos			
		Chrysotile	Amosite	Crocidolite	Other
May 26, 1994					
FS-SS-1-A	9:20 AM	ND	ND	ND	ND
FS-SS-1-B	11:45 AM	ND	ND	ND	ND
FS-SS-1-C	1:25 PM	ND	ND	ND	ND
May 27, 1994					
FS-SS-2-A	9:15 AM	ND	ND	ND	ND
FS-SS-2-B	11:25 AM	ND	ND	ND	ND
FS-SS-2-C	1:15 PM	ND	ND	ND	ND
FS-SS-2-D	2:45 PM	ND	ND	ND	ND
May 31, 1994					
FS-SS-3-A	10:40 AM	ND	ND	ND	ND
FS-SS-3-B	2:30 PM	ND	ND	ND	ND

ND Analyzed for but not detected
<1% Detected at concentrations less than 1%

Solid-Phase and Street Sweep Samples - Inorganic Analytical Results
Brooklyn

Solid-Phase Samples					
Sample ID	Sampling Time	Lead mg/kg	TCLP Lead mg/l	TPH mg/kg	Percent Solids
June 1, 1994					
BR-SP-1-A	9:10 AM	110	2.2	550	79
BR-SP-1-B	10:45 AM	1,500	11	1,100	67
BR-SP-1-C	12:30 PM	11,000	30	10,000	57
BR-SP-1-D	1:00 PM	8,500	31	1,000	73
June 2, 1994					
BR-SP-2-A	8:35 AM	1,200	3.6	1,200	69
BR-SP-2-B	9:25 AM	880	2	9,800	60
BR-SP-2-C	10:07 AM	740	2.8	3,500	34
BR-SP-2-D	11:50 AM	190	1.0	32,000	21
June 3, 1994					
BR-SP-3-A	10:17 AM	570	1.5	7,900	55
BR-SP-3-B	10:46 AM	1,200	2.2	6,500	40

Street Sweep Samples					
Sample ID	Sampling Time	Lead mg/kg	TCLP Lead mg/l	TPH mg/kg	Percent Solids
June 1, 1994					
BR-SS-1-A	9:30 AM	420	N/A	1,300	96
BR-SS-1-B	10:40 AM	630	ND	3,200	96
BR-SS-1-C	12:40 PM	1,400	ND	2,800	86
BR-SS-1-D	1:05 PM	330	0.72	4,100	87
June 2, 1994					
BR-SS-2-A	8:45 AM	1,600	N/A	9,400	83
BR-SS-2-B	9:30 AM	1,000	0.64	5,300	87
BR-SS-2-C	10:02 AM	460	N/A	2,700	97
BR-SS-2-D	12:05 PM	510	N/A	11,000	95
June 3, 1994					
BR-SS-3-A	9:42 AM	660	N/A	2,500	80
BR-SS-3-B	11:42 AM	5,600	N/A	1,200	91

ND Analyzed for but not detected
N/A Not Applicable. Corresponding solid phase sample was < 5.0 mg/l for TCLP lead. TCLP lead concentrations > 5.0 mg/l (regulatory level are shaded)

Solid-Phase Samples - PCB Analytical Results
Brooklyn

Sample ID	Sampling Time	Arochlor 1016 mg/kg	Arochlor 1221 mg/kg	Arochlor 1232 mg/kg	Arochlor 1242 mg/kg	Arochlor 1248 mg/kg	Arochlor 1254 mg/kg	Arochlor 1260 mg/kg	Total PCBs mg/kg
June 1, 1994									
BR-SP-1-A	9:10 AM	ND	ND	ND	ND	ND	ND	0.091	0.091
BR-SP-1-B	10:45 AM	ND	ND	ND	ND	15	ND	ND	15
BR-SP-1-C	12:30 PM	ND	ND	ND	ND	ND	17	ND	17
BR-SP-1-D	1:00 PM	ND	ND	ND	ND	ND	47	ND	47
June 2, 1994									
BR-SP-2-A	8:35 AM	ND	ND	ND	ND	ND	0.084	0.047	0.131
BR-SP-2-B	9:25 AM	ND	ND	ND	ND	ND	ND	0.22	0.22
BR-SP-2-C	10:07 AM	ND	ND	ND	ND	ND	0.12	0.1	0.22
BR-SP-2-D	11:50 AM	ND	ND	ND	ND	ND	0.34	ND	0.34
June 3, 1994									
BR-SP-3-A	10:17 AM	ND	ND	ND	ND	0.44	1.2	0.63	2.27
BR-SP-3-B	10:46 AM	ND	ND	ND	ND	0.13	0.4	0.22	0.75

ND Analyzed for but not detected

Solid-Phase Samples and Street Sweep Samples - Asbestos Results
Brooklyn

Solid-Phase Samples					
Sample ID	Sampling Time	Asbestos			
		Chrysotile	Amosite	Crocidolite	Other
June 1, 1994					
BR-SP-1-A	9:10 AM	1%	ND	ND	ND
BR-SP-1-B	10:45 AM	ND	ND	ND	ND
BR-SP-1-C	12:30 PM	<1%	ND	ND	ND
BR-SP-1-D	1:00 PM	<1%	ND	ND	ND
June 2, 1994					
BR-SP-2-A	8:35 AM	ND	ND	ND	ND
BR-SP-2-B	9:25 AM	<1%	ND	ND	ND
BR-SP-2-C	10:07 AM	ND	ND	ND	ND
BR-SP-2-D	11:50 AM	ND	ND	ND	ND
June 3, 1994					
BR-SP-3-A	10:17 AM	ND	ND	ND	ND
BR-SP-3-B	9:46 AM	ND	ND	ND	ND

Street Sweep Samples					
Sample ID	Sampling Time	Asbestos			
		Chrysotile	Amosite	Crocidolite	Other
June 1, 1994					
BR-SS-1-A	9:30 AM	ND	ND	ND	ND
BR-SS-1-B	10:40 AM	ND	ND	ND	ND
BR-SS-1-C	12:40 PM	<1%	ND	ND	ND
BR-SS-1-D	1:05 PM	ND	ND	ND	ND
June 2, 1994					
BR-SS-2-A	8:45 AM	ND	ND	ND	ND
BR-SS-2-B	9:30 AM	ND	ND	ND	ND
BR-SS-2-C	10:02 AM	ND	ND	ND	ND
BR-SS-2-D	12:05 PM	ND	ND	ND	ND
June 3, 1994					
BR-SS-3-A	9:42 AM	ND	ND	ND	ND
BR-SS-3-B	11:42 AM	ND	ND	ND	ND

ND Analyzed for but not detected
<1% Detected at concentrations less than 1%

Solid-Phase and Street Sweep Samples - Asbestos Results
Manhattan

Solid-Phase Samples					
	Sampling	Asbestos			
Sample ID	Time	Chrysotile	Amosite	Crocidolite	Other
June 8, 1994					
MN-SP-1-B	10:10 AM	ND	ND	ND	ND
MN-SP-1-C	1:15 PM	ND	ND	ND	ND
June 9, 1994					
MN-SP-2-A	10:20 AM	ND	ND	ND	ND
MN-SP-2-C	1:05 PM	ND	ND	ND	ND
June 10, 1994					
MN-SP-3-B	10:20 AM	ND	ND	ND	ND
MN-SP-3-C	11:45 AM	ND	ND	ND	ND

Street Sweep Samples					
	Sampling	Asbestos			
Sample ID	Time	Chrysotile	Amosite	Crocidolite	Other
June 8, 1994					
MN-SS-1-A	9:35 AM	ND	ND	ND	ND
MN-SS-1-B	10:05 AM	ND	ND	ND	ND
MN-SS-1-C	1:10 PM	ND	ND	ND	ND
MN-SS-1-D	2:50 PM	ND	ND	ND	ND
June 9, 1994					
MN-SS-2-A	10:15 AM	ND	ND	ND	ND
MN-SS-2-B	11:20 AM	ND	ND	ND	ND
MN-SS-2-C	1:00 PM	ND	ND	ND	ND
June 10, 1994					
MN-SS-3-A	8:46 AM	ND	ND	ND	ND
MN-SS-3-B	10:25 AM	ND	ND	ND	ND
MN-SS-3-C	11:55 AM	ND	ND	ND	ND

ND Analyzed for but not detected

Solid-Phase Samples - PCB Analytical Results
Manhattan

Sample ID	Sampling Time	Arochlor 1016 mg/kg	Arochlor 1221 mg/kg	Arochlor 1232 mg/kg	Arochlor 1242 mg/kg	Arochlor 1248 mg/kg	Arochlor 1254 mg/kg	Arochlor 1260 mg/kg	Total PCBs mg/kg
June 8, 1994									
MN-SP-1-B	10:10 AM	ND	ND	ND	ND	ND	0.15	0.12	0.27
MN-SP-1-C	1:15 PM	ND	ND	ND	ND	ND	4.7	ND	4.7
June 9, 1994									
MN-SP-2-A	10:20 AM	ND	ND	ND	ND	ND	0.24	ND	0.24
MN-SP-2-C	1:05 PM	ND	ND	ND	ND	ND	ND	ND	ND
June 10, 1994									
MN-SP-3-B	10:20 AM	ND	ND	ND	ND	ND	ND	0.14	0.14
MN-SP-3-C	11:45 AM	ND	ND	ND	ND	ND	ND	ND	ND

ND Analyzed for but not detected

Solid-Phase and Street Sweep Samples - Inorganic Analytical Results
Manhattan

Solid-Phase Samples					
Sample ID	Sampling Time	Lead mg/kg	TCLP Lead mg/l	TPH mg/kg	Percent Solids
June 8, 1994					
MN-SP-1-B	10:10 AM	4,000	28	860	48
MN-SP-1-C	1:15 PM	2,200	ND	200	30
June 9, 1994					
MN-SP-2-A	10:20 AM	780	4.2	48,000	39
MN-SP-2-C	1:05 PM	10,000	3.8	1,000	80
June 10, 1994					
MN-SP-3-B	10:20 AM	1,300	ND	1,800	51
MN-SP-3-C	11:45 AM	930	2.3	3,000	78

Street Sweep Samples					
Sample ID	Sampling Time	Lead mg/kg	TCLP Lead mg/l	TPH mg/kg	Percent Solids
June 8, 1994					
MN-SS-1-A	9:35 AM	1,300	ND	5,500	87
MN-SS-1-B	10:05 PM	410	ND	9,900	82
MN-SS-1-C	1:10 PM	120	N/A	1,900	84
MN-SS-1-D	2:50 PM	1,000	2.3	13,000	96
June 9, 1994					
MN-SS-2-A	10:15 AM	800	N/A	2,000	84
MN-SS-2-B	11:20 AM	520	ND	26,000	93
MN-SS-2-C	1:00 PM	540	N/A	9,400	99
June 10, 1994					
MN-SS-3-A	8:46 AM	1,000	ND	3,300	97
MN-SS-3-B	10:25 AM	660	N/A	970	84
MN-SS-3-C	11:55 AM	490	N/A	7,800	97

ND Analyzed for but not detected
N/A Not Applicable. Corresponding solid phase sample was < 5.0 mg/l for TCLP lead. TCLP lead concentrations > 5.0 mg/l (regulatory level are shaded)

Solid-Phase and Street Sweep Samples - Inorganic Analytical Results

Bronx

Solid-Phase Samples					
Sample ID	Sampling Time	Lead mg/kg	TCLP Lead mg/l	TPH mg/kg	Percent Solids
July 12, 1994					
HG-SP-1-A	9:00 AM	370	ND	39,000	37
HG-SP-1-B	10:15 AM	140	0.66	360	72
HG-SP-1-C	1:05 PM	1,900	3.6	2,300	87
July 14, 1994					
HG-SP-2-A	8:50 AM	1,000	1.8	340	43
HG-SP-2-C	11:25 AM	540	ND	9,800	62
July 15, 1994					
HG-SP-3-A	9:35 AM	550	6.9	1,300	82
HG-SP-3-B	10:40 AM	1,200	9.9	320	67
HG-SP-3-C	11:05 AM	2,900	6.1	55	71

Street Sweep Samples					
Sample ID	Sampling Time	Lead mg/kg	TCLP Lead mg/l	TPH mg/kg	Percent Solids
July 12, 1994					
HG-SS-1-A	9:10 AM	91	N/A	2,300	96
HG-SS-1-B	9:55 AM	190	N/A	1,100	77
HG-SS-1-C	1:10 PM	1,100	N/A	2,800	99
July 14, 1994					
HG-SS-2-A	8:55 AM	870	0.58	1,200	99
HG-SS-2-B	10:30 AM	1,400	ND	880	79
HG-SS-2-C	11:20 AM	560	N/A	2,600	76
July 15, 1994					
HG-SS-3-A	9:45 AM	680	12	590	82
HG-SS-3-B	10:30 AM	390	ND	600	80
HG-SS-3-C	11:20 AM	730	2.1	1,300	79

ND Analyzed for but not detected

N/A Not Applicable. Corresponding solid phase sample was < 5.0 mg/l for TCLP lead. TCLP lead concentrations > 5.0 mg/l (regulatory level are shaded)

Solid-Phase Samples - PCB Analytical Results
Bronx

Sample ID	Sampling Time	Arochlor 1016 mg/kg	Arochlor 1221 mg/kg	Arochlor 1232 mg/kg	Arochlor 1242 mg/kg	Arochlor 1248 mg/kg	Arochlor 1254 mg/kg	Arochlor 1260 mg/kg	Total PCBs mg/kg
July 12, 1994									
HG-SP-1-A	9:00 AM	ND	ND	ND	ND	ND	ND	ND	ND
HG-SP-1-B	10:15 AM	ND	ND	ND	ND	ND	ND	ND	ND
HG-SP-1-C	1:05 PM	ND	ND	ND	ND	ND	ND	0.85	0.85
July 14, 1994									
HG-SP-2-A	8:50 AM	ND	ND	ND	ND	ND	0.072	0.041	0.113
HG-SP-2-C	11:25 AM	ND	ND	ND	ND	ND	ND	ND	ND
July 15, 1994									
HG-SP-3-A	9:35 AM	ND	ND	ND	ND	ND	0.042	0.033	0.075
HG-SP-3-B	10:40 AM	ND	ND	ND	ND	ND	8.9	1.4	10.3
HG-SP-3-C	11:05 AM	ND	ND	ND	ND	ND	5.5	0.25	5.75

ND Analyzed for but not detected

Solid-Phase and Street Sweep Samples - Asbestos Results
Bronx

Solid-Phase Samples					
Sample ID	Sampling Time	Asbestos			
		Chrysotile	Amosite	Crocidolite	Other
July 12, 1994					
HG-SP-1-A	9:00 AM	ND	ND	ND	ND
HG-SP-1-B	10:15 AM	ND	ND	ND	ND
HG-SP-1-C	1:05 PM	ND	ND	ND	ND
July 14, 1994					
HG-SP-2-A	8:50 AM	ND	ND	ND	ND
HG-SP-2-C	11:25 AM	ND	ND	ND	ND
HG-SS-3-A					
HG-SP-3-A	9:35 AM	<1%	ND	ND	ND
HG-SP-3-B	10:40 AM	<1%	ND	ND	ND
HG-SP-3-C	11:05 AM	<1%	ND	ND	ND

Street Sweep Samples					
Sample ID	Sampling Time	Asbestos			
		Chrysotile	Amosite	Crocidolite	Other
July 12, 1994					
HG-SS-1-A	9:10 AM	ND	ND	ND	ND
HG-SS-1-B	9:55 AM	ND	ND	ND	ND
HG-SS-1-C	1:10 PM	ND	ND	ND	ND
July 14, 1994					
HG-SS-2-A	8:55 AM	ND	ND	ND	ND
HG-SS-2-B	10:30 AM	ND	ND	ND	ND
HG-SS-2-C	11:20 AM	ND	ND	ND	ND
July 15, 1994					
HG-SS-3-A	9:45 AM	<1%	ND	ND	ND
HG-SS-3-B	10:30 AM	ND	ND	ND	ND
HG-SS-3-C	11:20 AM	ND	ND	ND	ND

ND Analyzed for but not detected
<1% Detected at concentrations less than 1%

MHSOLIDS.XLS / hgspss asbestos

Appendix C
Analytical Results for Truck Solids Samples

Truck Solids Samples - Inorganic Analytical Results

Truck Solids Samples						
Sample ID	Date	Time	Lead (mg/kg)	TCLP Lead (mg/l)	TPH (mg/kg)	Solids (%)
Queens						
FS-TD-1-A	26-May-94	2:30 PM	570	0.71	2,800	47
FS-TD-2-A	27-May-94	4:10 PM	420	ND	9,400	67
FS-TD-3-A	31-May-94	5:15 PM	19,000	0.92	410	74
Brooklyn						
BR-TD-1-A	1-Jun-94	2:30 PM	670	29	4,400	78
BR-TD-2-A	2-Jun-94	1:05 PM	980	4.4	4,700	71
BR-TD-3-A	3-Jun-94	2:09 PM	680	9.4	4,600	75
Manhattan						
MN-TD-1-A	9-Jun-94	8:10 AM	5,400	7.7	9,300	44
MN-TD-2-A	9-Jun-94	2:35 PM	4,200	12	48,000	27
MN-TD-3-A	10-Jun-94	2:15 PM	1,700	8.8	3,100	66
Bronx						
HG-TD-1-A	12-Jul-94	3:18 PM	1,000	4.6	2,100	61
HG-TD-2-A	14-Jul-94	2:45 PM	2,200	2.1	1,300	49
HG-TD-3-A	15-Jul-94	2:05 PM	650	6.1	330	74

TCLP lead concentrations greater than the regulatory level of 5.0 mg/l are shaded

Truck Solids Samples - PCB Analytical Results

Truck Solids Samples										
Sample ID	Date	Time	Arochlor 1016 mg/kg	Arochlor 1221 mg/kg	Arochlor 1232 mg/kg	Arochlor 1242 mg/kg	Arochlor 1248 mg/kg	Arochlor 1254 mg/kg	Arochlor 1260 mg/kg	Total PCBs mg/kg
Queens										
FS-TD-1-A	26-May-94	2:30 PM	ND	ND	ND	ND	0.25	0.48	0.2	0.93
FS-TD-2-A	27-May-94	4:10 PM	ND	ND	ND	ND	ND	0.25	1.3	1.55
FS-TD-3-A	31-May-94	5:15 PM	ND	ND	ND	ND	ND	0.32	1.1	1.42
Brooklyn										
BR-TD-1-A	1-Jun-94	2:30 PM	ND	ND	ND	ND	0.56	0.65	0.13	1.34
BR-TD-2-A	2-Jun-94	1:05 PM	ND	ND	ND	ND	0.055	0.14	0.051	0.246
BR-TD-3-A	3-Jun-94	2:09 PM	ND	ND	ND	ND	0.15	0.36	0.25	0.76
Manhattan										
MN-TD-1-A	9-Jun-94	8:10 AM	ND	ND	ND	ND	0.97	5.9	ND	6.87
MN-TD-2-A	9-Jun-94	2:35 PM	ND	ND	ND	ND	ND	0.43	ND	0.43
MN-TD-3-A	10-Jun-94	2:15 PM	ND	ND	ND	ND	ND	0.1	0.059	0.159
Bronx										
HG-TD-1-A	12-Jul-94	3:18 PM	ND	ND	ND	ND	ND	0.53	ND	0.53
HG-TD-2-A	14-Jul-94	2:45 PM	ND	ND	ND	ND	ND	2.7	0.4	3.1
HG-TD-3-A	15-Jul-94	2:05 PM	ND	ND	ND	ND	ND	1.0	ND	1.0

ND Analyzed for but not detected

Truck Solids Samples - Asbestos Results

Truck Solids Samples						
Sample ID	Sampling Date	Sampling Time	Asbestos			
			Chrysotile	Amosite	Crocidolite	Other
Queens						
FS-TD-1-A	26-May-94	2:30 PM	ND	ND	ND	ND
FS-TD-2-A	27-May-94	4:15 PM	<1%	ND	ND	ND
FS-TD-3-A	31-May-94	5:15 PM	ND	ND	ND	ND
Brooklyn						
BR-TD-1-A	1-Jun-94	2:30 PM	<1%	ND	ND	ND
BR-TD-2-A	2-Jun-94	1:05 PM	ND	ND	ND	ND
BR-TD-3-A	3-Jun-94	2:09 PM	ND	ND	ND	ND
Manhattan						
MN-TD-1-A	9-Jun-94	8:10 AM	<1%	ND	ND	ND
MN-TD-2-A	9-Jun-94	2:35 PM	ND	ND	ND	ND
MN-TD-2-X	9-Jun-94	2:35 PM	ND	ND	ND	ND
MN-TD-3-A	10-Jun-94	2:15 PM	ND	ND	ND	ND
Bronx						
HG-TD-1-A	12-Jul-94	3:18 PM	ND	ND	ND	ND
HG-TD-2-A	14-Jul-94	2:45 PM	ND	ND	ND	ND
HG-TD-2-X	14-Jul-94	2:45 PM	ND	ND	ND	ND
HG-TD-3-A	15-Jul-94	2:05 PM	<1%	ND	ND	ND

ND Analyzed for but not detected
<1% Detected at concentrations less than one percent

Appendix D
Analytical Results for Liquid-Phase Samples and Overflow-Water Samples

Liquid-Phase and Overflow-Water Samples - Inorganic Analytical Results
Queens

Liquid-Phase Samples								
Sampling ID	Sampling Time	Cadmium mg/l	CLP Cadmiu mg/l	Copper mg/l	Lead mg/l	TCLP Lead mg/l	TPH mg/l	TSS mg/l
Regulatory Level		2.0	1.0	5.0	2.0	5.0	50	N/A
May 26, 1994								
FS-LP-1-A	9:30 AM	ND	ND	0.13	0.036	ND	ND	15
FS-LP-1-B	11:25 AM	0.021	ND	1.9	2.3	ND	6.9	960
FS-LP-1-C	1:00 PM	ND	ND	ND	0.016	ND	ND	22
May27, 1994								
FS-LP-2-A	8:50 AM	ND	ND	0.041	0.041	ND	470	45
FS-LP-2-D	2:20 PM	ND	ND	0.60	0.087	ND	0.79	15

Overflow-Water Samples								
Sampling ID	Sampling Time	Cadmium mg/l	CLP Cadmiu mg/l	Copper mg/l	Lead mg/l	TCLP Lead mg/l	TPH mg/l	TSS mg/l
Regulatory Level		2.0	1.0	5.0	2.0	5.0	50	N/A
May 27, 1994								
FS-OF-2-A	9:00 AM	ND	ND	0.47	0.48	ND	9.7	260
May 31, 1994								
FS-OF-3-B	2:35 PM	0.091	0.014	2.4	17	ND	1.1	6,000

N/A Not Applicable
ND Analyzed for but not detected
Values greater than the regulatory levels are shaded

Liquid-Phase and Overflow-Water Samples - PCB Analytical Results
Queens

Liquid-Phase Samples									
Sampling ID	Sampling Time	Arochlor 1016 µg/l	Arochlor 1221 µg/l	Arochlor 1232 µg/l	Arochlor 1242 µg/l	Arochlor 1248 µg/l	Arochlor 1254 µg/l	Arochlor 1260 µg/l	Total PCBs µg/l
Regulatory Level		ND	ND	ND	ND	ND	ND	ND	ND
May 26, 1994									
FS-LP-1-A	9:30 AM	ND	ND	ND	ND	ND	ND	ND	ND
FS-LP-1-B	11:25 AM	ND	ND	ND	ND	ND	ND	ND	ND
FS-LP-1-C	1:00 PM	ND	ND	ND	ND	ND	ND	ND	ND
May27, 1994									
FS-LP-2-A	8:50 AM	ND	ND	ND	ND	ND	ND	ND	ND
FS-LP-2-D	2:20 PM	ND	ND	ND	ND	ND	ND	ND	ND

Overflow-Water Samples									
Sampling ID	Sampling Time	Arochlor 1016 µg/l	Arochlor 1221 µg/l	Arochlor 1232 µg/l	Arochlor 1242 µg/l	Arochlor 1248 µg/l	Arochlor 1254 µg/l	Arochlor 1260 µg/l	Total PCBs µg/l
Regulatory Level		ND	ND	ND	ND	ND	ND	ND	ND
May 27, 1994									
FS-OF-2-A	9:00 AM	ND	ND	ND	ND	ND	1.6	ND	1.6
May 31, 1994									
FS-OF-3-B	2:35 PM	ND	ND	ND	ND	ND	IND	22	22

ND Analyzed for but not detected
IND Indeterminate due to the presence of Arochlor 1260 pattern
Values greater than the regulatory levels are shaded

Liquid-Phase and Overflow-Water Samples - Inorganic Analytical Results
Brooklyn

Liquid-Phase Samples								
Sampling I	Sampling Time	Cadmium mg/l	TCLP Cadmium mg/l	Copper mg/l	Lead mg/l	TCLP Lead mg/l	TPH mg/l	TSS mg/l
Regulatory Level		2.0	1.0	5.0	2.0	5.0	50	N/A
June 1, 1994								
BR-LP-1-B	10:30 AM	ND	ND	0.091	1.4	ND	49	310
BR-LP-1-C	12:20 PM	0.072	ND	4.0	25	ND	450	6,800
June 2, 1994								
BR-LP-2-A	8:30 AM	ND	ND	0.054	0.51	ND	7.6	96
BR-LP-2-B	9:20 AM	0.069	ND	11	8.6	ND	410	28,000
BR-LP-2-C	10:00 AM	0.023	ND	3.5	3.6	ND	120	1,300
BR-LP-2-D	11:25 AM	0.021	ND	1.2	2.7	ND	580	61
June 3, 1994								
BR-LP-3-A	9:55 AM	0.0087	ND	0.14	0.34	ND	3.5	130
BR-LP-3-B	11:17 AM	0.025	ND	0.78	1.6	ND	380	3,500

Overflow-Water Sample								
Sampling I	Sampling Time	Cadmium mg/l	TCLP Cadmium mg/l	Copper mg/l	Lead mg/l	TCLP Lead mg/l	TPH mg/l	TSS mg/l
Regulatory Level		2.0	1.0	5.0	2.0	5.0	50	N/A
June 3, 1994								
BR-OF-3-B	11:35 AM	0.10	ND	2.2	4.4	ND	180	3,800

N/A Not Applicable
ND Analyzed for but not detected
Values greater than the regulatory levels are shaded

Liquid-Phase and Overflow-Water Samples - PCB Analytical Results
Brooklyn

Liquid-Phase Samples									
Sampling ID	Sampling Time	Arochlor 1016 µg/l	Arochlor 1221 µg/l	Arochlor 1232 µg/l	Arochlor 1242 µg/l	Arochlor 1248 µg/l	Arochlor 1254 µg/l	Arochlor 1260 µg/l	Total PCBs µg/l
Regulatory Level		ND	ND	ND	ND	ND	ND	ND	ND
June 1, 1994									
BR-LP-1-B	10:30 AM	ND	ND	ND	ND	ND	ND	ND	ND
BR-LP-1-C	12:20 PM	ND	ND	ND	ND	ND	7.6	0.76	8.36
June 2, 1994									
BR-LP-2-A	8:30 AM	ND	ND	ND	ND	ND	ND	ND	ND
BR-LP-2-B	9:20 AM	ND	ND	ND	ND	ND	ND	ND	ND
BR-LP-2-C	10:00 AM	ND	ND	ND	ND	ND	ND	ND	ND
BR-LP-2-D	11:25 AM	ND	ND	ND	ND	ND	ND	ND	ND
June 3, 1994									
BR-LP-3-A	9:55 AM	ND	ND	ND	ND	ND	ND	ND	ND
BR-LP-3-B	11:17 AM	ND	ND	ND	ND	ND	ND	ND	ND

Overflow-Water Sample									
Sampling ID	Sampling Time	Arochlor 1016 µg/l	Arochlor 1221 µg/l	Arochlor 1232 µg/l	Arochlor 1242 µg/l	Arochlor 1248 µg/l	Arochlor 1254 µg/l	Arochlor 1260 µg/l	Total PCBs µg/l
Regulatory Level		ND	ND	ND	ND	ND	ND	ND	ND
June 3, 1994									
BR-OF-3-B	11:35 AM	ND	ND	ND	ND	1.00	0.71	0.61	2.32

ND Analyzed for but not detected
Values greater than the regulartory levels are shaded

MHLIQUID.XLS / brlpof PCB

Liquid-Phase and Overflow-Water Samples - Inorganic Analytical Results
Manhattan

Liquid-Phase Samples								
Sampling ID	Sampling Time	Cadmium mg/l	CLP Cadmiu mg/l	Copper mg/l	Lead mg/l	TCLP Lead mg/l	TPH mg/l	TSS mg/l
Regulatory Level		2.0	1.0	5.0	2.0	5.0	50	N/A
June 8, 1994								
MN-LP-1-A	9:15 AM	ND	ND	0.069	0.034	ND	5.4	49
MN-LP-1-C	12:45 PM	ND	ND	0.033	0.01	ND	ND	4
June 9, 1994								
MN-LP-2-A	9:50 AM	0.018	ND	0.91	5.4	ND	140	1,800
MN-LP-2-B	11:05 AM	ND	ND	0.095	0.62	ND	37	220
MN-LP-2-C	12:40 PM	ND	ND	ND	0.015	ND	ND	33
June 10, 1994								
MN-LP-3-A	8:35 AM	0.004	ND	0.23	0.26	ND	450	430
MN-LP-3-B	10:05 AM	0.042	ND	10	14	ND	36	39,000
MN-LP-3-C	11:30 AM	ND	ND	0.045	0.12	ND	12	180

Overflow-Water Samples								
Sampling ID	Sampling Time	Cadmium mg/l	CLP Cadmiu mg/l	Copper mg/l	Lead mg/l	TCLP Lead mg/l	TPH mg/l	TSS mg/l
Regulatory Level		2.0	1.0	5.0	2.0	5.0	50	N/A
June 8, 1994								
MN-OF-1-C	1:00 PM	0.0059	ND	1.3	2.3	ND	8.4	290
MN-OF-1-D	2:45 PM	0.0064	ND	8.4	2.6	ND	4.7	270
June 9, 1994								
MN-OF-2-C	12:50 PM	0.0075	ND	0.68	2.9	ND	49	380

N/A Not applicable
ND Analyzed for but not detected
Values greater than the regulatory levels are shaded

Liquid-Phase and Overflow-Water Samples - PCB Analytical Results
Manhattan

Liquid-Phase Samples									
Sampling ID	Sampling Time	Arochlor 1016 µg/l	Arochlor 1221 µg/l	Arochlor 1232 µg/l	Arochlor 1242 µg/l	Arochlor 1248 µg/l	Arochlor 1254 µg/l	Arochlor 1260 µg/l	Total PCBs µg/l
Regulatory Level		ND	ND	ND	ND	ND	ND	ND	ND
June 8, 1994									
MN-LP-1-A	9:15 AM	ND	ND	ND	ND	ND	ND	ND	ND
MN-LP-1-C	12:45 PM	ND	ND	ND	ND	ND	0.52	ND	0.52
June 9, 1994									
MN-LP-2-A	9:50 AM	ND	ND	ND	ND	ND	ND	ND	ND
MN-LP-2-B	11:05	ND	ND	ND	ND	ND	ND	ND	ND
MN-LP-2-C	12:40 PM	ND	ND	ND	ND	ND	ND	ND	ND
June 10, 1994									
MN-LP-3-A	8:35 AM	ND	ND	ND	ND	1.50	1.9	1.3	4.7
MN-LP-3-B	10:05 AM	ND	ND	ND	ND	ND	ND	ND	ND
MN-LP-3-C	11:30 AM	ND	ND	ND	ND	ND	ND	ND	ND

Overflow-Water Samples									
Sampling ID	Sampling Time	Arochlor 1016 µg/l	Arochlor 1221 µg/l	Arochlor 1232 µg/l	Arochlor 1242 µg/l	Arochlor 1248 µg/l	Arochlor 1254 µg/l	Arochlor 1260 µg/l	Total PCBs µg/l
Regulatory Level		ND	ND	ND	ND	ND	ND	ND	ND
June 8, 1994									
MN-OF-1-C	1:00 PM	ND	ND	ND	ND	ND	1.5	ND	1.5
MN-OF-1-D	2:45 PM	ND	ND	ND	ND	ND	5.3	ND	5.3
June 9, 1994									
MN-OF-2-C	12:50 PM	ND	ND	ND	ND	ND	ND	ND	ND

ND Analyzed for but not detected
Values greater than the regulatory levels are shaded

MHLIQUID.XLS / manhattan pcb

Liquid-Phase and Overflow-Water Samples - Inorganic Analytical Results
Bronx

Liquid-Phase Samples								
ampling I	Sampling Time	Cadmium mg/l	CLP Cadmiu mg/l	Copper mg/l	Lead mg/l	TCLP Lead mg/l	TPH mg/l	TSS mg/l
Regulatory Level		2.0	1.0	5.0	2.0	5.0	50	N/A
July 12, 1994								
HG-LP-1-A	8:50 AM	0.0055	ND	0.095	0.20	ND	70	1,000
HG-LP-1-B	9:55 AM	ND	ND	ND	0.066	ND	ND	13
July 14, 1994								
HG-LP-2-A	8:30 AM	ND	ND	0.041	0.62	ND	ND	8.0
HG-LP-2-B	10:15 AM	ND	ND	ND	0.025	ND	3.9	23
HG-LP-2-C	11:10 AM	ND	ND	ND	0.022	ND	3.0	4.0
July 15, 1994								
HG-LP-3-A	9:20 AM	ND	ND	ND	0.042	ND	0.78	7.0

Overflow-Water Samples								
ampling I	Sampling Time	Cadmium mg/l	CLP Cadmiu mg/l	Copper mg/l	Lead mg/l	TCLP Lead mg/l	TPH mg/l	TSS mg/l
Regulatory Level		2.0	1.0	5.0	2.0	5.0	50	N/A
July 12, 1994								
HG-OF-1-B	10:10 AM	0.010	ND	0.630	2.60	ND	14	540
July 14, 1994								
HG-OF-2-A	8:40 AM	0.0081	ND	0.94	5.6	ND	22	870
HG-OF-2-C	11:15 AM	0.0044	ND	0.58	3.1	0.5	5.4	700
July 15, 1994								
HG-OF-3-A	9:30 AM	ND	ND	0.1	0.5	ND	1.1	55

N/A Not Applicable
ND Analyzed for but not detected
Values greater than the regulatory levels are shaded

MHLIQUID.XLS / hglpof inorganic

Liquid-Phase and Overflow-Water Samples - PCB Analytical Results
Bronx

Liquid-Phase Samples									
Sampling ID	Sampling Time	Arochlor 1016 µg/l	Arochlor 1221 µg/l	Arochlor 1232 µg/l	Arochlor 1242 µg/l	Arochlor 1248 µg/l	Arochlor 1254 µg/l	Arochlor 1260 µg/l	Total PCBs µg/l
Regulatory Level		ND	ND	ND	ND	ND	ND	ND	ND
July 12, 1994									
HG-LP-1-A	8:50 AM	ND	ND	ND	ND	ND	ND	ND	ND
HG-LP-1-B	9:55 AM	ND	ND	ND	ND	ND	ND	ND	ND
July 14, 1994									
HG-LP-2-A	8:30 AM	ND	ND	ND	ND	ND	ND	ND	ND
HG-LP-2-B	10:15 AM	ND	ND	ND	ND	ND	ND	ND	ND
HG-LP-2-C	11:10 AM	ND	ND	ND	ND	ND	ND	ND	ND
July 15, 1994									
HG-LP-3-A	9:20 AM	ND	ND	ND	ND	1.4	1.6	ND	3.0

Overflow-Water Samples									
Sampling ID	Sampling Time	Arochlor 1016 µg/l	Arochlor 1221 µg/l	Arochlor 1232 µg/l	Arochlor 1242 µg/l	Arochlor 1248 µg/l	Arochlor 1254 µg/l	Arochlor 1260 µg/l	Total PCBs µg/l
Regulatory Level		ND	ND	ND	ND	ND	ND	ND	ND
July 12, 1994									
HG-OF-1-B	10:10 AM	ND	ND	ND	ND	ND	ND	ND	ND
July 14, 1994									
HG-OF-2-A	8:40 AM	ND	ND	ND	ND	ND	5.1	ND	5.1
HG-OF-2-C	11:15 AM	ND	ND	ND	ND	ND	3.3	ND	3.3
July 15, 1994									
HG-OF-3-A	9:30 AM	ND	ND	ND	ND	ND	1.2	ND	1.2

ND Analyzed for but not detected
Values greater than the regulatory level are shaded

Appendix E
Laboratory Data With Reporting Limits

Laboratory Analytical Results for Solid-Phase, Street Sweep, and Truck Solids Samples

Sampling ID	CH2M HILL Location Code	Sampling Date	Sampling Time	Arochlor 1016 (mg/kg)		Arochlor 1221 (mg/kg)		Arochlor 1232 (mg/kg)		Arochlor 1242 (mg/kg)		Arochlor 1248 (mg/kg)		Arochlor 1254 (mg/kg)		Arochlor 1260 (mg/kg)	
FS-SS-1-A	FS-1-A	5/26/94	9:20 AM		NR		NR		NR		NR		NR		NR		NR
FS-SS-1-X	FS-1-A	5/26/94	9:20 AM		NR		NR		NR		NR		NR		NR		NR
FS-SP-1-A	FS-1-A	5/26/94	9:40 AM	0.025	U	0.0091	U	0.02	U	0.014	U	0.011	U	0.5		0.26	
FS-SP-1-B	FS-1-B	5/26/94	11:30 AM	0.036	U	0.013	U	0.028	U	0.02	U	0.015	U	0.022	U	2.9	
FS-SS-1-B	FS-1-B	5/26/94	11:45 AM		NR		NR		NR		NR		NR		NR		NR
FS-SP-1-C	FS-1-C	5/26/94	1:20 PM	0.045	U	0.016	U	0.036	U	0.025	U	0.019	U	0.028	U	0.11	
FS-SS-1-C	FS-1-C	5/26/94	1:25 PM		NR		NR		NR		NR		NR		NR		NR
FS-TD-1-A	Truck Solids	5/26/94	2:30 PM	0.037	U	0.013	U	0.03	U	0.02	U	0.25		0.48		0.2	
FS-SP-2-A	FS-2-A	5/27/94	9:10 AM	0.040	U	0.014	U	0.031	U	0.022	U	0.016	U	0.1		0.079	
FS-SS-2-A	FS-2-A	5/27/94	9:15 AM		NR		NR		NR		NR		NR		NR		NR
FS-SP-2-B	FS-2-B	5/27/94	11:05 AM	0.021	U	0.0077	U	0.017	U	0.012	U	0.0089	U	0.013	U	6.5	
FS-SS-2-B	FS-2-B	5/27/94	11:25 AM		NR		NR		NR		NR		NR		NR		NR
FS-SP-2-C	FS-2-C	5/27/94	1:05 PM	0.019	U	0.0069	U	0.015	U	0.011	U	0.008	U	0.024		0.061	
FS-SS-2-C	FS-2-C	5/27/94	1:15 PM		NR		NR		NR		NR		NR		NR		NR
FS-SP-2-D	FS-2-D	5/27/94	2:30 PM	0.024	U	0.0087	U	0.019	U	0.013	U	0.01	U	0.12		0.084	
FS-SP-2-X	FS-2-D	5/27/94	2:30 PM	0.024	U	0.0086	U	0.019	U	0.013	U	0.01	U	0.1		0.091	
FS-SS-2-D	FS-2-D	5/27/94	2:45 PM		NR		NR		NR		NR		NR		NR		NR
FS-TD-2-A	Truck Solids	5/27/94	4:10 PM	0.026	U	0.0094	U	0.021	U	0.014	U	0.011	U	0.25		1.3	
FS-SP-3-A	FS-3-A	5/31/94	10:30 AM	0.027	U	0.0095	U	0.021	U	0.015	U	0.011	U	0.22		0.13	
FS-SP-3-X	FS-3-A	5/31/94	10:30 AM	0.026	U	0.0093	U	0.02	U	0.014	U	0.011	U	0.19		0.11	
FS-SS-3-A	FS-3-A	5/31/94	10:40 AM		NR		NR		NR		NR		NR		NR		NR
FS-SS-3-B	FS-3-B	5/31/94	2:30 PM		NR		NR		NR		NR		NR		NR		NR
FS-SP-3-B	FS-3-B	5/31/94	2:45 PM	0.021	U	0.0077	U	0.017	U	0.012	U	0.0089	U	1.1		0.062	
FS-TD-3-A	Truck Solids	5/31/94	5:15 PM	0.024	U	0.0085	U	0.019	U	0.013	U	0.0099	U	0.32		1.1	
BR-SP-1-A	BR-1-A	6/1/94	9:10 AM	0.022	U	0.0079	U	0.017	U	0.012	U	0.0092	U	0.014	U	0.091	
BR-SP-1-X	BR-1-A	6/1/94	9:10 AM	0.021	U	0.0077	U	0.017	U	0.012	U	0.0089	U	0.07		0.072	
BR-SS-1-A	BR-1-A	6/1/94	9:30 AM		NR		NR		NR		NR		NR		NR		NR
BR-SS-1-B	BR-1-B	6/1/94	10:40 AM		NR		NR		NR		NR		NR		NR		NR
BR-SP-1-B	BR-1-B	6/1/94	10:45 AM	0.026	U	0.0093	U	0.02	U	0.014	U	15		0.016	U	0.023	U
BR-SP-1-C	BR-1-C	6/1/94	12:30 PM	0.031	U	0.011	U	0.024	U	0.017	U	0.013	U	17		0.027	U
BR-SS-1-C	BR-1-C	6/1/94	12:40 PM		NR		NR		NR		NR		NR		NR		NR
BR-SP-1-D	BR-1-D	6/1/94	1:00 PM	0.024	U	0.0085	U	0.019	U	0.013	U	0.0098	U	47		0.021	U
BR-SS-1-D	BR-1-D	6/1/94	1:05 PM		NR		NR		NR		NR		NR		NR		NR
BR-TD-1-A	Truck Solids	6/1/94	2:30 PM	0.022	U	0.0079	U	0.017	U	0.012	U	0.56		0.65		0.13	
BR-SP-2-A	BR-2-A	6/2/94	8:35 AM	0.025	U	0.009	U	0.02	U	0.014	U	0.01	U	0.084		0.047	
BR-SS-2-A	BR-2-A	6/2/94	8:45 AM		NR		NR		NR		NR		NR		NR		NR
BR-SP-2-B	BR-2-B	6/2/94	9:25 AM	0.029	U	0.01	U	0.023	U	0.016	U	0.012	U	0.018	U	0.22	
BR-SS-2-B	BR-2-B	6/2/94	9:30 AM		NR		NR		NR		NR		NR		NR		NR
BR-SS-2-C	BR-2-C	6/2/94	10:02 AM		NR		NR		NR		NR		NR		NR		NR
BR-SP-2-C	BR-2-C	6/2/94	10:07 AM	0.051	U	0.018	U	0.04	U	0.028	U	0.021	U	0.12		0.1	
BR-SP-2-D	BR-2-D	6/2/94	11:50 AM	0.083	U	0.03	U	0.066	U	0.046	U	0.035	U	0.34		0.074	U
BR-SS-2-D	BR-2-D	6/2/94	12:05 PM		NR		NR		NR		NR		NR		NR		NR

U Analyzed for but not detected. Value is the reportimg limit.
NR Analysis not requested

Sampling ID	CH2M HILL Location Code	Sampling Date	Sampling Time	Arochlor 1016 (mg/kg)		Arochlor 1221 (mg/kg)		Arochlor 1232 (mg/kg)		Arochlor 1242 (mg/kg)		Arochlor 1248 (mg/kg)		Arochlor 1254 (mg/kg)		Arochlor 1260 (mg/kg)	
BR-TD-2-X	Truck Solids	6/2/94	1:05 PM	0.025	U	0.0091	U	0.02	U	0.014	U	0.053		0.071		0.059	
BR-TD-2-A	Truck Solids	6/2/94	1:05 PM	0.025	U	0.0088	U	0.019	U	0.014	U	0.055		0.14		0.051	
BR-SS-3-A	BR-3-A	6/3/94	9:42 AM		NR		NR		NR		NR		NR		NR		NR
BR-SP-3-A	BR-3-A	6/3/94	10:17 AM	0.032	U	0.011	U	0.025	U	0.017	U	0.44		1.2		0.63	
BR-SS-3-B	BR-3-B	6/3/94	11:42 AM		NR		NR		NR		NR		NR		NR		NR
BR-SP-3-B	BR-3-B	6/3/94	11:46 AM	0.044	U	0.016	U	0.035	U	0.024	U	0.13		0.4		0.22	
BR-SP-3-X	BR-3-B	6/3/94	11:46 AM	0.039	U	0.014	U	0.031	U	0.021	U	0.2		0.66		0.47	
BR-TD-3-A	Truck Solids	6/3/94	2:09 PM	0.023	U	0.0082	U	0.018	U	0.013	U	0.15		0.36		0.25	
MN-SS-1-A	MN-1-A	6/8/94	9:35 AM		NR		NR		NR		NR		NR		NR		NR
MN-SS-1-B	MN-1-B	6/8/94	10:05 AM		NR		NR		NR		NR		NR		NR		NR
MN-SP-1-B	MN-1-B	6/8/94	10:10 AM	0.036	U	0.013	U	0.029	U	0.02	U	0.015	U	0.15		0.12	
MN-SS-1-C	MN-1-C	6/8/94	1:10 PM		NR		NR		NR		NR		NR		NR		NR
MN-SP-1-C	MN-1-C	6/8/94	1:15 PM	0.058	U	0.021	U	0.046	U	0.032	U	0.024	U	4.7		0.052	U
MN-SS-1-D	MN-1-D	6/8/94	2:50 PM		NR		NR		NR		NR		NR		NR		NR
MN-SS-1-X	MN-1-D	6/8/94	2:55 PM		NR		NR		NR		NR		NR		NR		NR
MN-TD-1-A	Truck Solids	6/9/94	8:10 AM	0.040	U	0.014	U	0.031	U	0.022	U	0.97		5.9		0.035	U
MN-SS-2-A	MN-2-A	6/9/94	10:15 AM		NR		NR		NR		NR		NR		NR		NR
MN-SP-2-A	MN-2-A	6/9/94	10:20 AM	0.045	U	0.016	U	0.035	U	0.024	U	0.019	U	0.24		0.039	U
MN-SS-2-B	MN-2-B	6/9/94	11:20 AM		NR		NR		NR		NR		NR		NR		NR
MN-SS-2-C	MN-2-C	6/9/94	1:00 PM		NR		NR		NR		NR		NR		NR		NR
MN-SP-2-C	MN-2-C	6/9/94	1:05 PM	0.021	U	0.0077	U	0.017	U	0.012	U	0.0089	U	0.013	U	0.019	U
MN-TD-2-A	Truck Solids	6/9/94	2:35 PM	0.064	U	0.023	U	0.051	U	0.035	U	0.027	U	0.43		0.057	U
MN-TD-2-X	Truck Solids	6/9/94	2:35 PM	0.063	U	0.023	U	0.05	U	0.035	U	0.026	U	0.53		0.056	U
MN-SS-3-A	MN-3-A	6/10/94	8:46 AM		NR		NR		NR		NR		NR		NR		NR
MN-SP-3-B	MN-3-B	6/10/94	10:20 AM	0.034	U	0.012	U	0.026	U	0.018	U	0.014	U	0.021	U	0.14	
MN-SS-3-B	MN-3-B	6/10/94	10:25 AM		NR		NR		NR		NR		NR		NR		NR
MN-SP-3-C	MN-3-C	6/10/94	11:45 AM	0.022	U	0.0079	U	0.017	U	0.012	U	0.0092	U	0.014	U	0.019	U
MN-SP-3-X	MN-3-C	6/10/94	11:45 AM	0.057	U	0.021	U	0.045	U	0.031	U	0.024	U	0.035	U	0.05	U
MN-SS-3-C	MN-3-C	6/10/94	11:55 AM		NR		NR		NR		NR		NR		NR		NR
MN-TD-3-A	Truck Solids	6/10/94	2:15 PM	0.026	U	0.0093	U	0.02	U	0.014	U	0.011	U	0.1		0.059	
HG-SP-1-A	HG-1-A	7/12/94	9:00 AM	0.047	U	0.017	U	0.037	U	0.026	U	0.02	U	0.029	U	0.041	U
HG-SP-1-X	HG-1-A	7/12/94	9:00 AM	0.048	U	0.017	U	0.038	U	0.027	U	0.02	U	0.03	U	0.043	U
HG-SS-1-A	HG-1-A	7/12/94	9:10 AM		NR		NR		NR		NR		NR		NR		NR
HG-SS-1-B	HG-1-B	7/12/94	9:55 AM		NR		NR		NR		NR		NR		NR		NR
HG-SP-1-B	HG-1-B	7/12/94	10:15 AM	0.024	U	0.0087	U	0.019	U	0.013	U	0.01	U	0.015	U	0.021	U
HG-SP-1-C	HG-1-C	7/12/94	1:05 PM	0.020	U	0.0072	U	0.016	U	0.011	U	0.0084	U	0.012	U	0.85	
HG-SS-1-C	HG-1-C	7/12/94	1:10 PM		NR		NR		NR		NR		NR		NR		NR
HG-TD-1-A	Truck Solids	7/12/94	3:18 PM	0.028	U	0.01	U	0.022	U	0.016	U	0.012	U	0.53		0.025	U
HG-SP-2-A	HG-2-A	7/14/94	8:50 AM	0.04	U	0.014	U	0.032	U	0.022	U	0.017	U	0.072		0.041	
HG-SS-2-A	HG-2-A	7/14/94	8:55 AM		NR		NR		NR		NR		NR		NR		NR
HG-SS-2-B	HG-2-B	7/14/94	10:30 AM		NR		NR		NR		NR		NR		NR		NR
HG-SS-2-C	HG-2-C	7/14/94	11:20 AM		NR		NR		NR		NR		NR		NR		NR

U Analyzed for but not detected. Value is the reportimg limit.
NR Analysis not requested

Sampling ID	CH2M HILL Location Code	Sampling Date	Samping Time	Arochlor 1016 (mg/kg)		Arochlor 1221 (mg/kg)		Arochlor 1232 (mg/kg)		Arochlor 1242 (mg/kg)		Arochlor 1248 (mg/kg)		Arochlor 1254 (mg/kg)		Arochlor 1260 (mg/kg)	
HG-SP-2-C	HG-2-C	7/14/94	11:25 AM	0.028	U	0.01	U	0.022	U	0.015	U	0.012	U	0.017	U	0.025	U
HG-TD-2-A	Truck Solids	7/14/94	2:45 PM	0.035	U	0.013	U	0.028	U	0.019	U	0.015	U	2.7		0.4	
HG-TD-2-X	Truck Solids	7/14/94	2:45 PM	0.035	U	0.013	U	0.028	U	0.019	U	0.015	U	3		0.46	
HG-SP-3-A	HG-3-A	7/15/94	9:35 AM	0.021	U	0.0075	U	0.016	U	0.011	U	0.0087	U	0.042		0.033	
HG-SS-3-A	HG-3-A	7/15/94	9:45 AM		NR		NR		NR		NR		NR		NR		NR
HG-SS-3-B	HG-3-B	7/15/94	10:30 AM		NR		NR		NR		NR		NR		NR		NR
HG-SP-3-B	HG-3-B	7/15/94	10:40 AM	0.025	U	0.0091	U	0.02	U	0.014	U	0.011	U	8.9		1.4	
HG-SP-3-C	HG-3-C	7/15/94	11:05 AM	0.024	U	0.0088	U	0.019	U	0.013	U	0.01	U	5.5		0.25	
HG-SP-3-X	HG-3-C	7/15/94	11:05 AM	0.03	U	0.011	U	0.024	U	0.017	U	0.013	U	5.7		0.34	
HG-SS-3-C	HG-3-C	7/15/94	11:20 AM		NR		NR		NR		NR		NR		NR		NR
HG-TD-3-A	Truck Solids	7/15/94	2:05 PM	0.023	U	0.0083	U	0.018	U	0.013	U	0.0096	U	1		0.02	U

U Analyzed for but not detected. Value is the reportimg limit.
NR Analysis not requested

Sampling ID	CH2M HILL Location Code	Sampling Date	Samping Time	Lead (mg/kg)	TCLP Lead (mg/l)		TPH (mg/kg)	Percent Solids
FS-SS-1-A	FS-1-A	5/26/94	9:20 AM	1500		NR	400	76
FS-SS-1-X	FS-1-A	5/26/94	9:20 AM	2000		NR	480	77
FS-SP-1-A	FS-1-A	5/26/94	9:40 AM	450	1.3		1600	69
FS-SP-1-B	FS-1-B	5/26/94	11:30 AM	1900	0.64		470	49
FS-SS-1-B	FS-1-B	5/26/94	11:45 AM	590		NR	4200	77
FS-SP-1-C	FS-1-C	5/26/94	1:20 PM	640	0.5	U	1100	39
FS-SS-1-C	FS-1-C	5/26/94	1:25 PM	97		NR	1300	80
FS-TD-1-A	Truck Solids	5/26/94	2:30 PM	570	0.71		2800	47
FS-SP-2-A	FS-2-A	5/27/94	9:10 AM	390	0.5	U	8800	44
FS-SS-2-A	FS-2-A	5/27/94	9:15 AM	230		NR	1400	58
FS-SP-2-B	FS-2-B	5/27/94	11:05 AM	450	0.5	U	53000	82
FS-SS-2-B	FS-2-B	5/27/94	11:25 AM	460		NR	4600	94
FS-SP-2-C	FS-2-C	5/27/94	1:05 PM	260	2.5		230	91
FS-SS-2-C	FS-2-C	5/27/94	1:15 PM	260		NR	1900	89
FS-SP-2-D	FS-2-D	5/27/94	2:30 PM	450	0.5	U	970	72
FS-SP-2-X	FS-2-D	5/27/94	2:30 PM	960	0.5	U	920	73
FS-SS-2-D	FS-2-D	5/27/94	2:45 PM	440		NR	3800	83
FS-TD-2-A	Truck Solids	5/27/94	4:10 PM	420	0.5	U	9400	67
FS-SP-3-A	FS-3-A	5/31/94	10:30 AM	97	0.5	U	1000	66
FS-SP-3-X	FS-3-A	5/31/94	10:30 AM	98	0.5	U	1600	68
FS-SS-3-A	FS-3-A	5/31/94	10:40 AM	93		NR	1600	93
FS-SS-3-B	FS-3-B	5/31/94	2:30 PM	430		NR	2700	89
FS-SP-3-B	FS-3-B	5/31/94	2:45 PM	11000	0.5	U	200	82
FS-TD-3-A	Truck Solids	5/31/94	5:15 PM	19000	0.92		410	74
BR-SP-1-A	BR-1-A	6/1/94	9:10 AM	110	2.2		550	79
BR-SP-1-X	BR-1-A	6/1/94	9:10 AM	8500	8.6		540	80
BR-SS-1-A	BR-1-A	6/1/94	9:30 AM	420		NR	1300	96
BR-SS-1-B	BR-1-B	6/1/94	10:40 AM	630	0.5	U	3200	96
BR-SP-1-B	BR-1-B	6/1/94	10:45 AM	1500	11		1100	67
BR-SP-1-C	BR-1-C	6/1/94	12:30 PM	11000	30		10000	57
BR-SS-1-C	BR-1-C	6/1/94	12:40 PM	1400	0.5	U	2800	86
BR-SP-1-D	BR-1-D	6/1/94	1:00 PM	8500	31		1000	73
BR-SS-1-D	BR-1-D	6/1/94	1:05 PM	330	0.72		4100	87
BR-TD-1-A	Truck Solids	6/1/94	2:30 PM	670	29		4400	78
BR-SP-2-A	BR-2-A	6/2/94	8:35 AM	1200	3.6		1200	69
BR-SS-2-A	BR-2-A	6/2/94	8:45 AM	1600		NR	9400	83
BR-SP-2-B	BR-2-B	6/2/94	9:25 AM	880	2		9800	60
BR-SS-2-B	BR-2-B	6/2/94	9:30 AM	1000	0.64		5300	87
BR-SS-2-C	BR-2-C	6/2/94	10:02 AM	460		NR	2700	97
BR-SP-2-C	BR-2-C	6/2/94	10:07 AM	740	2.8		3500	34
BR-SP-2-D	BR-2-D	6/2/94	11:50 AM	190	1		32000	21
BR-SS-2-D	BR-2-D	6/2/94	12:05 PM	510		NR	11000	95

U Analyzed for but not detected. Value is the reportimg limit.
NR Analysis not requested

Laboratory Analytical Results for Solid-Phase, Street Sweep, and Truck Solids Samples

Sampling ID	CH2M HILL Location Code	Sampling Date	Samping Time	Lead (mg/kg)	TCLP Lead (mg/l)		TPH (mg/kg)	Percent Solids
BR-TD-2-X	Truck Solids	6/2/94	1:05 PM	79000	2.2		4800	69
BR-TD-2-A	Truck Solids	6/2/94	1:05 PM	980	4.4		4700	71
BR-SS-3-A	BR-3-A	6/3/94	9:42 AM	660		NR	2500	80
BR-SP-3-A	BR-3-A	6/3/94	10:17 AM	570	1.5		7900	55
BR-SS-3-B	BR-3-B	6/3/94	11:42 AM	5600		NR	1200	91
BR-SP-3-B	BR-3-B	6/3/94	11:46 AM	1200	2.2		6500	40
BR-SP-3-X	BR-3-B	6/3/94	11:46 AM	700	1.2		2100	45
BR-TD-3-A	Truck Solids	6/3/94	2:09 PM	680	9.4		4600	75
MN-SS-1-A	MN-1-A	6/8/94	9:35 AM	1300	0.5	U	5500	87
MN-SS-1-B	MN-1-B	6/8/94	10:05 AM	410	0.5	U	9900	82
MN-SP-1-B	MN-1-B	6/8/94	10:10 AM	4000	28		860	48
MN-SS-1-C	MN-1-C	6/8/94	1:10 PM	120		NR	1900	84
MN-SP-1-C	MN-1-C	6/8/94	1:15 PM	2200	0.5	U	200	30
MN-SS-1-D	MN-1-D	6/8/94	2:50 PM	1000	2.3		13000	96
MN-SS-1-X	MN-1-D	6/8/94	2:55 PM	2100	2.8		9800	96
MN-TD-1-A	Truck Solids	6/9/94	8:10 AM	5400	7.7		9300	44
MN-SS-2-A	MN-2-A	6/9/94	10:15 AM	800		NR	2000	84
MN-SP-2-A	MN-2-A	6/9/94	10:20 AM	780	4.2		48000	39
MN-SS-2-B	MN-2-B	6/9/94	11:20 AM	520	0.5	U	26000	93
MN-SS-2-C	MN-2-C	6/9/94	1:00 PM	540		NR	9400	99
MN-SP-2-C	MN-2-C	6/9/94	1:05 PM	10000	3.8		1000	80
MN-TD-2-A	Truck Solids	6/9/94	2:35 PM	4200	12		48000	27
MN-TD-2-X	Truck Solids	6/9/94	2:35 PM	4100	11		32000	27
MN-SS-3-A	MN-3-A	6/10/94	8:46 AM	1000	0.5	U	3300	97
MN-SP-3-B	MN-3-B	6/10/94	10:20 AM	1300	0.5	U	1800	51
MN-SS-3-B	MN-3-B	6/10/94	10:25 AM	660		NR	970	84
MN-SP-3-C	MN-3-C	6/10/94	11:45 AM	930	2.3		3000	78
MN-SP-3-X	MN-3-C	6/10/94	11:45 AM	560	2.2		8700	30
MN-SS-3-C	MN-3-C	6/10/94	11:55 AM	490		NR	7800	97
MN-TD-3-A	Truck Solids	6/10/94	2:15 PM	1700	8.8		3100	66
HG-SP-1-A	HG-1-A	7/12/94	9:00 AM	370	0.5	U	39000	37
HG-SP-1-X	HG-1-A	7/12/94	9:00 AM	630	0.5	U	62000	36
HG-SS-1-A	HG-1-A	7/12/94	9:10 AM	91		NR	2300	96
HG-SS-1-B	HG-1-B	7/12/94	9:55 AM	190		NR	1100	77
HG-SP-1-B	HG-1-B	7/12/94	10:15 AM	140	0.66		360	72
HG-SP-1-C	HG-1-C	7/12/94	1:05 PM	1900	3.6		2300	87
HG-SS-1-C	HG-1-C	7/12/94	1:10 PM	1100		NR	2800	99
HG-TD-1-A	Truck Solids	7/12/94	3:18 PM	1000	4.6		2100	61
HG-SP-2-A	HG-2-A	7/14/94	8:50 AM	1000	1.8		340	43
HG-SS-2-A	HG-2-A	7/14/94	8:55 AM	870	0.58		1200	99
HG-SS-2-B	HG-2-B	7/14/94	10:30 AM	1400	0.5	U	880	79
HG-SS-2-C	HG-2-C	7/14/94	11:20 AM	560		NR	2600	76

U Analyzed for but not detected. Value is the reportimg limit.
NR Analysis not requested

Sampling ID	CH2M HILL Location Code	Sampling Date	Samping Time	Lead (mg/kg)	TCLP Lead (mg/l)		TPH (mg/kg)	Percent Solids
HG-SP-2-C	HG-2-C	7/14/94	11:25 AM	540	0.5	U	9800	62
HG-TD-2-A	Truck Solids	7/14/94	2:45 PM	2200	2.1		1300	49
HG-TD-2-X	Truck Solids	7/14/94	2:45 PM	2400	2.1		440	48
HG-SP-3-A	HG-3-A	7/15/94	9:35 AM	550	6.9		1300	82
HG-SS-3-A	HG-3-A	7/15/94	9:45 AM	680	12		590	82
HG-SS-3-B	HG-3-B	7/15/94	10:30 AM	390	0.5	U	600	80
HG-SP-3-B	HG-3-B	7/15/94	10:40 AM	1200	9.9		320	67
HG-SP-3-C	HG-3-C	7/15/94	11:05 AM	2900	6.1		55	71
HG-SP-3-X	HG-3-C	7/15/94	11:05 AM	4500	7.6		130	57
HG-SS-3-C	HG-3-C	7/15/94	11:20 AM	730	2.1		1300	79
HG-TD-3-A	Truck Solids	7/15/94	2:05 PM	650	6.1		330	74

U Analyzed for but not detected. Value is the reportimg limit.
NR Analysis not requested

Laboratory Analytical Results for Liquid-Phase, Overflow-Water, and Equipment Blank Samples

Sampling ID	CH2M HILL Location Code	Sampling Date	Sampling Time	Arochlor 1016 (µg/l)		Arochlor 1221 (µg/l)		Arochlor 1232 (µg/l)		Arochlor 1242 (µg/l)		Arochlor 1248 (µg/l)		Arochlor 1254 (µg/l)		Arochlor 1260 (µg/l)	
FS-LP-1-A	FS-1-A	5/26/94	9:30 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
FS-LP-1-B	FS-1-B	5/26/94	11:25 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
FS-LP-1-C	FS-1-C	5/26/94	1:00 PM	0.24	U	0.2	U	0.055	U	0.025	U	0.41	U	0.21	U	0.32	U
FS-LP-1-X	FS-1-C	5/26/94	1:00 PM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
FS-LP-2-A	FS-2-A	5/27/94	8:50 AM	0.3	U	0.24	U	0.069	U	0.032	U	0.51	U	0.26	U	0.4	U
FS-OF-2-A	FS-2-A	5/27/94	9:00 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	1.6		0.31	U
FS-LP-2-D	FS-2-D	5/27/94	2:20 PM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
FS-LP-2-X	FS-2-D	5/27/94	2:20 PM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
FS-SP-EB-2	Blank	5/27/94	---	0.24	U	0.2	U	0.056	U	0.026	U	0.42	U	0.21	U	0.33	U
FS-SP-EB-3	Blank	5/31/94	8:15 AM	0.24	U	0.2	U	0.055	U	0.025	U	0.41	U	0.21	U	0.32	U
FS-OF-3-B	FS-3-B	5/31/94	2:35 PM	0.24	U	0.2	U	0.056	U	0.026	U	0.41	U		IND	22	
FS-OF-3-X	FS-3-B	5/31/94	2:35 PM	0.24	U	0.2	U	0.056	U	0.026	U	0.41	U		IND	17	
BR-LP-1-B	BR-1-B	6/1/94	10:30 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
BR-LP-1-X	BR-1-B	6/1/94	10:30 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
BR-LP-1-C	BR-1-C	6/1/94	12:20 PM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	7.6		0.76	
BR-SP-EB-1	Blank	6/1/94	2:20 PM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
BR-SP-EB-2	Blank	6/2/94	7:20 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
BR-LP-2-A	BR-2-A	6/2/94	8:30 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
BR-LP-2-X	BR-2-A	6/2/94	8:30 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
BR-LP-2-B	BR-2-B	6/2/94	9:20 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
BR-LP-2-C	BR-2-C	6/2/94	10:00 AM	0.3	U	0.25	U	0.069	U	0.032	U	0.51	U	0.26	U	0.41	U
BR-LP-2-D	BR-2-D	6/2/94	11:25 AM	0.29	U	0.24	U	0.067	U	0.031	U	0.49	U	0.25	U	0.39	U
BR-SP-EB-3	Blank	6/3/94	6:55 AM	0.24	U	0.19	U	0.055	U	0.025	U	0.4	U	0.21	U	0.32	U
BR-LP-3-A	BR-3-A	6/3/94	9:55 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
BR-LP-3-X	BR-3-1	6/3/94	9:55 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
BR-LP-3-B	BR-3-B	6/3/94	11:17 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
BR-OF-3-B	BR-3-B	6/3/94	11:35 AM	0.23	U	0.19	U	0.054	U	0.025	U	1		0.71		0.61	
MN-SP-EB-1	Blank	6/8/94	6:45 AM	0.24	U	0.2	U	0.056	U	0.026	U	0.42	U	0.21	U	0.33	U
MN-LP-1-A	MN-1-A	6/8/94	9:15 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
MN-LP-1-X	MN-1-A	6/8/94	9:15 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
MN-LP-1-C	MN-1-C	6/8/94	12:45 PM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.52		0.31	U
MN-OF-1-C	MN-1-C	6/8/94	1:00 PM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	1.5		0.31	U
MN-OF-1-D	MN-1-D	6/8/94	2:45 PM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	5.3		0.31	U
MN-SP-EB-2	Blank	6/9/94	7:00 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
MN-LP-2-A	MN-2-A	6/9/94	9:50 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
MN-LP-2-X	MN-2-A	6/9/94	9:50 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
MN-LP-2-B	MN-2-B	6/9/94	11:05 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
MN-LP-2-C	MN-2-C	6/9/94	12:40 PM	0.24	U	0.2	U	0.056	U	0.026	U	0.42	U	0.21	U	0.33	U

U Analyzed for but not detected. Value is the reporting limit.
NR Analysis not requested
IND Indeterminate due to the presence of Arochlor 1260 pattern

Sampling ID	CH2M HILL Location Code	Sampling Date	Sampling Time	Arochlor 1016 (µg/l)		Arochlor 1221 (µg/l)		Arochlor 1232 (µg/l)		Arochlor 1242 (µg/l)		Arochlor 1248 (µg/l)		Arochlor 1254 (µg/l)		Arochlor 1260 (µg/l)	
MN-OF-2-C	MN-2-C	6/9/94	12:50 PM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
MN-SP-EB-3	Blank	6/10/94	6:50 AM	0.24	U	0.2	U	0.055	U	0.025	U	0.41	U	0.21	U	0.32	U
MN-LP-3-A	MN-3-A	6/10/94	8:35 AM	0.32	U	0.26	U	0.073	U	0.034	U	1.5		1.9		1.3	
MN-LP-3-B	MN-3-B	6/10/94	10:05 AM	0.24	U	0.2	U	0.056	U	0.026	U	0.42	U	0.21	U	0.33	U
MN-LP-3-X	MN-3-B	6/10/94	10:05 AM	0.24	U	0.2	U	0.056	U	0.026	U	0.41	U	0.21	U	0.33	U
MN-LP-3-C	MN-3-C	6/10/94	11:30 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
HG-SP-EB-1	Blank	7/12/94	7:10 AM	0.24	U	0.2	U	0.056	U	0.026	U	0.41	U	0.21	U	0.33	U
HG-LP-1-A	HG-1-A	7/12/94	8:50 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
HG-LP-1-X	HG-1-A	7/12/94	8:50 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
HG-LP-1-B	HG-1-B	7/12/94	9:55 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
HG-OF-1-B	HG-1-B	7/12/94	10:10 AM	0.29	U	0.24	U	0.068	U	0.031	U	0.5	U	0.26	U	0.39	U
HG-SP-EB-2	Blank	7/14/94	7:10 AM	0.24	U	0.2	U	0.056	U	0.026	U	0.42	U	0.21	U	0.33	U
HG-LP-2-A	HG-2-A	7/14/94	8:30 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.21	U	0.32	U
HG-LP-2-X	HG-2-A	7/14/94	8:30 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
HG-OF-2-A	HG-2-A	7/14/94	8:40 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	5.1		0.31	U
HG-LP-2-B	HG-2-B	7/14/94	10:15 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	0.2	U	0.31	U
HG-LP-2-C	HG-2-C	7/14/94	11:10 AM	0.24	U	0.2	U	0.056	U	0.026	U	0.41	U	0.21	U	0.33	U
HG-OF-2-C	HG-2-C	7/14/94	11:15 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	3.3		0.31	U
HG-SP-EB-3	Blank	7/15/94	7:10 AM	0.24	U	0.2	U	0.056	U	0.026	U	0.42	U	0.21	U	0.33	U
HG-LP-3-A	HG-3-A	7/15/94	9:20 AM	0.24	U	0.19	U	0.055	U	0.025	U	1.4		1.6		0.32	U
HG-LP-3-X	HG-3-A	7/15/94	9:20 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	1		0.31	U
HG-OF-3-A	HG-3-A	7/15/94	9:30 AM	0.23	U	0.19	U	0.054	U	0.025	U	0.4	U	1.2		0.31	U

U Analyzed for but not detected. Value is the reporting limit.
NR Analysis not requested
IND Indeterminate due to the presence of Arochlor 1260 pattern

Sampling ID	CH2M HILL Location Code	Sampling Date	Sampling Time	Cadmium (mg/l)		TCLP Cadmium (mg/l)		Copper (mg/l)		Lead (mg/l)		TCLP Lead (mg/l)		TPH (mg/l)		TSS (mg/l)	
FS-LP-1-A	FS-1-A	5/26/94	9:30 AM	0.004	U	0.005	U	0.13		0.036		0.5	U	0.5	U	15	
FS-LP-1-B	FS-1-B	5/26/94	11:25 AM	0.021		0.005	U	1.9		2.3		0.5	U	6.9		960	
FS-LP-1-C	FS-1-C	5/26/94	1:00 PM	0.004	U	0.005	U	0.025	U	0.016		0.5	U	0.5	U	22	
FS-LP-1-X	FS-1-C	5/26/94	1:00 PM	0.004	U	0.005	U	0.044		0.018		0.5	U	0.53		22	
FS-LP-2-A	FS-2-A	5/27/94	8:50 AM	0.004	U	0.005	U	0.041		0.041		0.5	U	470		45	
FS-OF-2-A	FS-2-A	5/27/94	9:00 AM	0.004	U	0.005	U	0.47		0.48		0.5	U	9.7		260	
FS-LP-2-D	FS-2-D	5/27/94	2:20 PM	0.004	U	0.005	U	0.6		0.087		0.5	U	0.79		15	
FS-LP-2-X	FS-2-D	5/27/94	2:20 PM	0.004	U	0.005	U	0.54		0.081		0.5	U	0.85		11	
FS-SP-EB-2	Blank	5/27/94	---		NR		NR		NR	0.003	U	0.5	U		NR		NR
FS-SP-EB-3	Blank	5/31/94	8:15 AM		NR		NR		NR	0.0031		0.5	U		NR		NR
FS-OF-3-B	FS-3-B	5/31/94	2:35 PM	0.091		0.014		2.4		17		0.5	U	1.1		6000	
FS-OF-3-X	FS-3-B	5/31/94	2:35 PM	0.1		0.034		3.2		19		0.5	U	1.4		11000	
BR-LP-1-B	BR-1-B	6/1/94	10:30 AM	0.004	U	0.005	U	0.091		1.4		0.1	U	49		310	
BR-LP-1-X	BR-1-B	6/1/94	10:30 AM	0.004	U	0.005	U	0.086		0.87		0.1	U	21		290	
BR-LP-1-C	BR-1-C	6/1/94	12:20 PM	0.072		0.005	U	4		25		0.1	U	450		6800	
BR-SP-EB-1	Blank	6/1/94	2:20 PM	0.004	U	0.005	U	0.025	U	0.0031		0.1	U		NR		NR
BR-SP-EB-2	Blank	6/2/94	7:20 AM		NR		NR		NR	0.003	U	0.5	U		NR		NR
BR-LP-2-A	BR-2-A	6/2/94	8:30 AM	0.004	U	0.005	U	0.054		0.51		0.5	U	7.6		96	
BR-LP-2-X	BR-2-A	6/2/94	8:30 AM	0.004	U	0.005	U	0.085		0.79		0.5	U	12		120	
BR-LP-2-B	BR-2-B	6/2/94	9:20 AM	0.069		0.005	U	11		8.6		0.5	U	410		28000	
BR-LP-2-C	BR-2-C	6/2/94	10:00 AM	0.023		0.005	U	3.5		3.6		0.5	U	120		1300	
BR-LP-2-D	BR-2-D	6/2/94	11:25 AM	0.021		0.005	U	1.2		2.7		0.5	U	580		61	
BR-SP-EB-3	Blank	6/3/94	6:55 AM		NR		NR		NR	0.003	U	0.5	U		NR		NR
BR-LP-3-A	BR-3-A	6/3/94	9:55 AM	0.0087		0.005	U	0.14		0.34		0.5	U	3.5		130	
BR-LP-3-X	BR-3-1	6/3/94	9:55 AM	0.0073		0.005	U	0.16		0.32		0.5	U	4.9		110	
BR-LP-3-B	BR-3-B	6/3/94	11:17 AM	0.025		0.005	U	0.78		1.6		0.5	U	380		3500	
BR-OF-3-B	BR-3-B	6/3/94	11:35 AM	0.1		0.005	U	2.2		4.4		0.5	U	180		3800	
MN-SP-EB-1	Blank	6/8/94	6:45 AM		NR		NR		NR	0.003	U	0.5	U		NR		NR
MN-LP-1-A	MN-1-A	6/8/94	9:15 AM	0.004	U	0.005	U	0.069		0.034		0.5	U	5.4		49	
MN-LP-1-X	MN-1-A	6/8/94	9:15 AM	0.004	U	0.005	U	0.061		0.032		0.5	U	12		44	
MN-LP-1-C	MN-1-C	6/8/94	12:45 PM	0.004	U	0.005	U	0.033		0.01		0.5	U	0.5	U	4	
MN-OF-1-C	MN-1-C	6/8/94	1:00 PM	0.0059		0.005	U	1.3		2.3		0.5	U	8.4		290	
MN-OF-1-D	MN-1-D	6/8/94	2:45 PM	0.0064		0.005	U	8.4		2.6		0.5	U	4.7		270	
MN-SP-EB-2	Blank	6/9/94	7:00 AM		NR		NR		NR	0.003	U	0.5	U		NR		NR
MN-LP-2-A	MN-2-A	6/9/94	9:50 AM	0.018		0.005	U	0.91		5.4		0.5	U	140		1800	
MN-LP-2-X	MN-2-A	6/9/94	9:50 AM	0.025		0.005	U	1.3		7.7		0.5	U	130		1800	
MN-LP-2-B	MN-2-B	6/9/94	11:05 AM	0.004	U	0.005	U	0.095		0.62		0.5	U	37		220	
MN-LP-2-C	MN-2-C	6/9/94	12:40 PM	0.004	U	0.005	U	0.025	U	0.015		0.5	U	0.5	U	33	

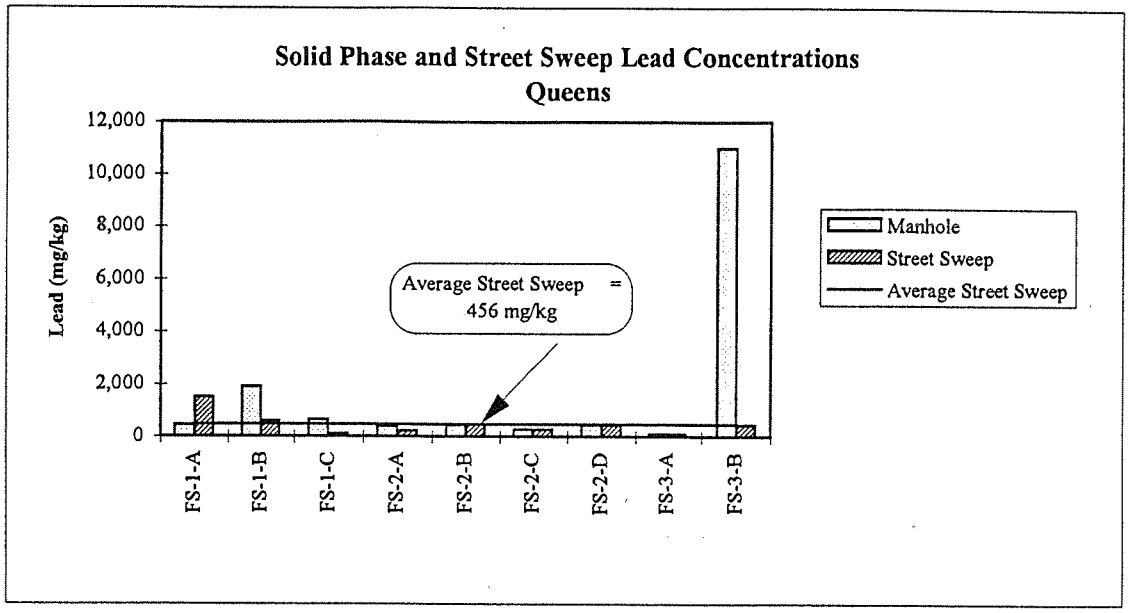
U Analyzed for but not detected. Value is the reporting limit.
NR Analysis not requested
IND Indeterminate due to the presence of Arochlor 1260 pattern

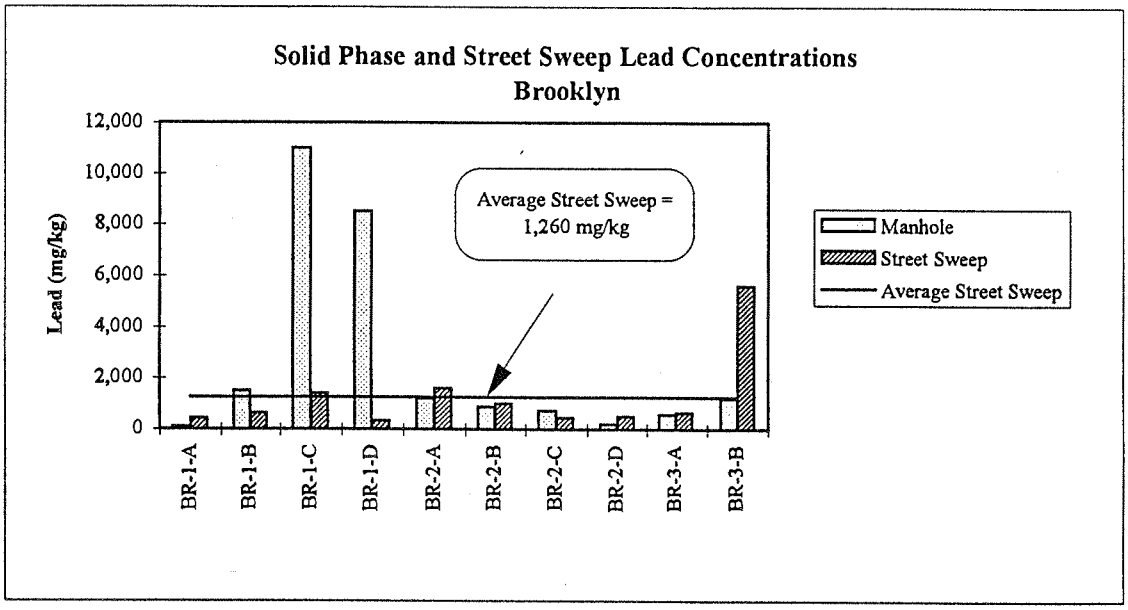
Laboratory Analytical Results for Liquid-Phase, Overflow-Water, and Equipment Blank Samples

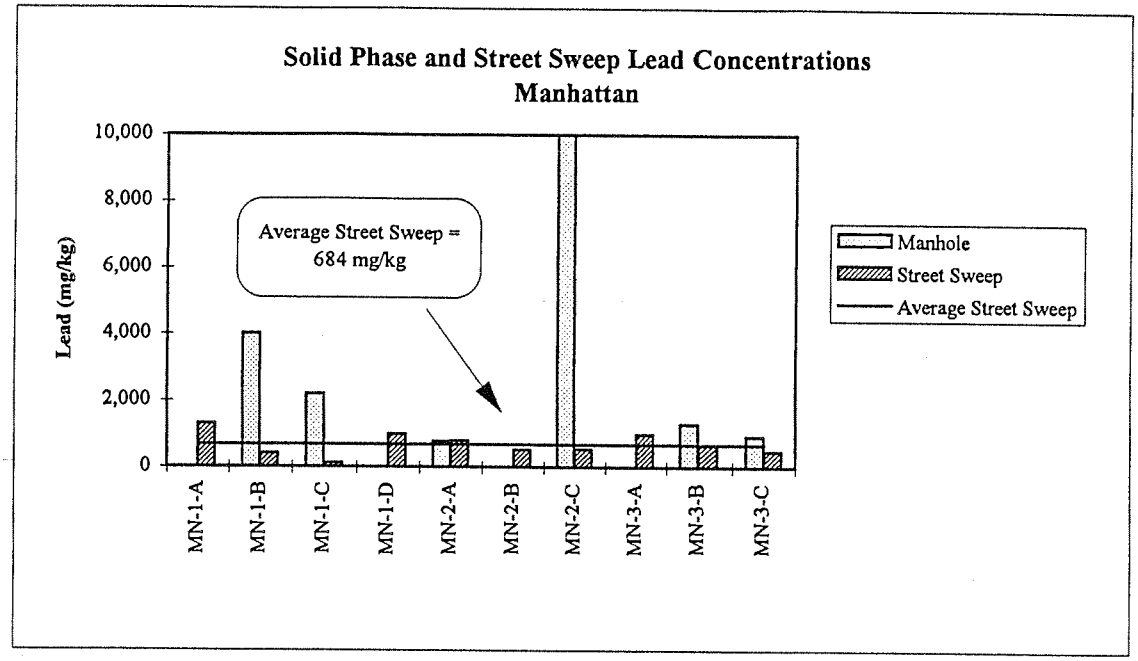
Sampling ID	CH2M HILL Location Code	Sampling Date	Sampling Time	Cadmium (mg/l)		TCLP Cadmium (mg/l)		Copper (mg/l)		Lead (mg/l)		TCLP Lead (mg/l)		TPH (mg/l)		TSS (mg/l)	
MN-OF-2-C	MN-2-C	6/9/94	12:50 PM	0.0075		0.005	U	0.68		2.9		0.5	U	49		380	
MN-SP-EB-3	Blank	6/10/94	6:50 AM				NR		NR	0.003	U	0.5	U		NR		NR
MN-LP-3-A	MN-3-A	6/10/94	8:35 AM	0.004		0.005	U	0.23		0.26		0.5	U	450		430	
MN-LP-3-B	MN-3-B	6/10/94	10:05 AM	0.042		0.005	U	10		14		0.5	U	36		39000	
MN-LP-3-X	MN-3-B	6/10/94	10:05 AM	0.091		0.005	U	19		30		0.5	U	55		43000	
MN-LP-3-C	MN-3-C	6/10/94	11:30 AM	0.004	U	0.005	U	0.045		0.12		0.5	U	12		180	
HG-SP-EB-1	Blank	7/12/94	7:10 AM		NR		NR		NR	0.003	U		NR		NR	0.5	U
HG-LP-1-A	HG-1-A	7/12/94	8:50 AM	0.0055		0.005	U	0.095		0.2		0.5	U	70		1000	
HG-LP-1-X	HG-1-A	7/12/94	8:50 AM	0.006		0.005	U	0.17		0.5		0.5	U	92		1500	
HG-LP-1-B	HG-1-B	7/12/94	9:55 AM	0.004	U	0.005	U	0.025	U	0.066		0.5	U	0.5	U	13	
HG-OF-1-B	HG-1-B	7/12/94	10:10 AM	0.01		0.005	U	0.63		2.6		0.5	U	14		540	
HG-SP-EB-2	Blank	7/14/94	7:10 AM		NR		NR		NR	0.003	U	0.5	U		NR		NR
HG-LP-2-A	HG-2-A	7/14/94	8:30 AM	0.004	U	0.005	U	0.041		0.62		0.5	U	0.5	U	8	
HG-LP-2-X	HG-2-A	7/14/94	8:30 AM	0.004	U	0.005	U	0.031		0.58		0.5	U	0.5	U	7	
HG-OF-2-A	HG-2-A	7/14/94	8:40 AM	0.0081		0.005	U	0.94		5.6		0.5	U	22		870	
HG-LP-2-B	HG-2-B	7/14/94	10:15 AM	0.004	U	0.005	U	0.025	U	0.025		0.5	U	3.9		23	
HG-LP-2-C	HG-2-C	7/14/94	11:10 AM	0.004	U	0.005	U	0.025	U	0.022		0.5	U	3		4	
HG-OF-2-C	HG-2-C	7/14/94	11:15 AM	0.0044		0.005	U	0.58		3.1		0.5		5.4		700	
HG-SP-EB-3	Blank	7/15/94	7:10 AM		NR		NR		NR	0.003	U	0.5	U		NR		NR
HG-LP-3-A	HG-3-A	7/15/94	9:20 AM	0.004	U	0.005	U	0.025	U	0.042		0.5	U	0.78		7	
HG-LP-3-X	HG-3-A	7/15/94	9:20 AM	0.004	U	0.005	U	0.025	U	0.024	U	0.5	U	0.66		7	
HG-OF-3-A	HG-3-A	7/15/94	9:30 AM	0.004	U	0.005	U	0.083		0.53		0.5	U	1.1		55	

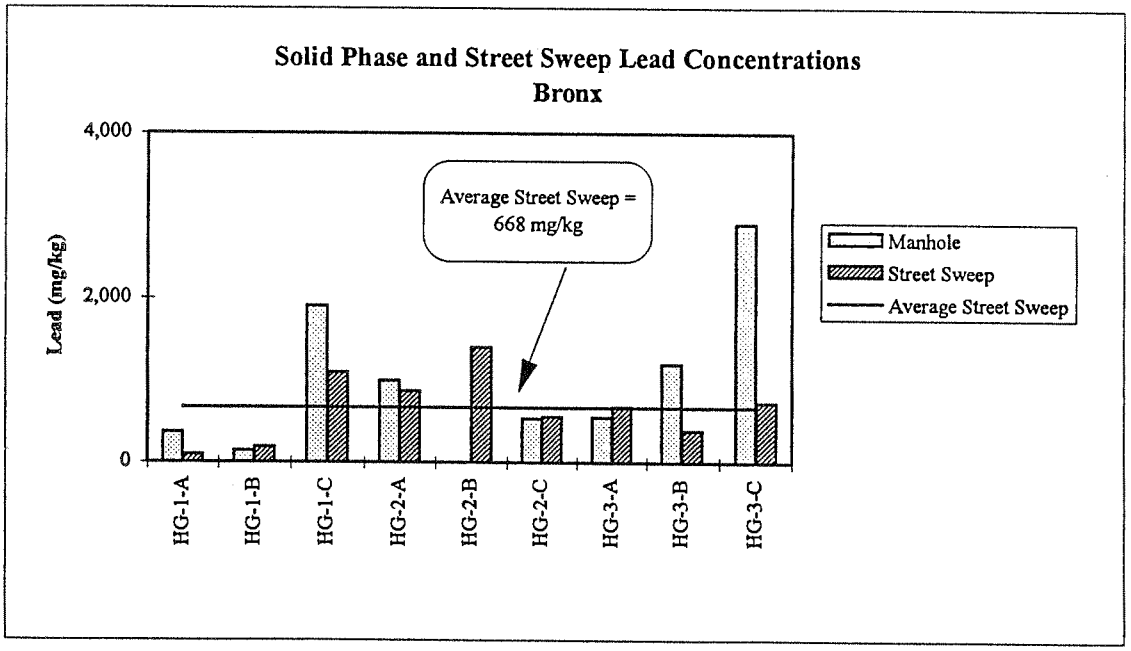
U Analyzed for but not detected. Value is the reporting limit.
NR Analysis not requested
IND Indeterminate due to the presence of Arochlor 1260 pattern

Appendix F
Graphical Presentation of Lead Concentrations in Solid-Phase and Street Sweep Samples

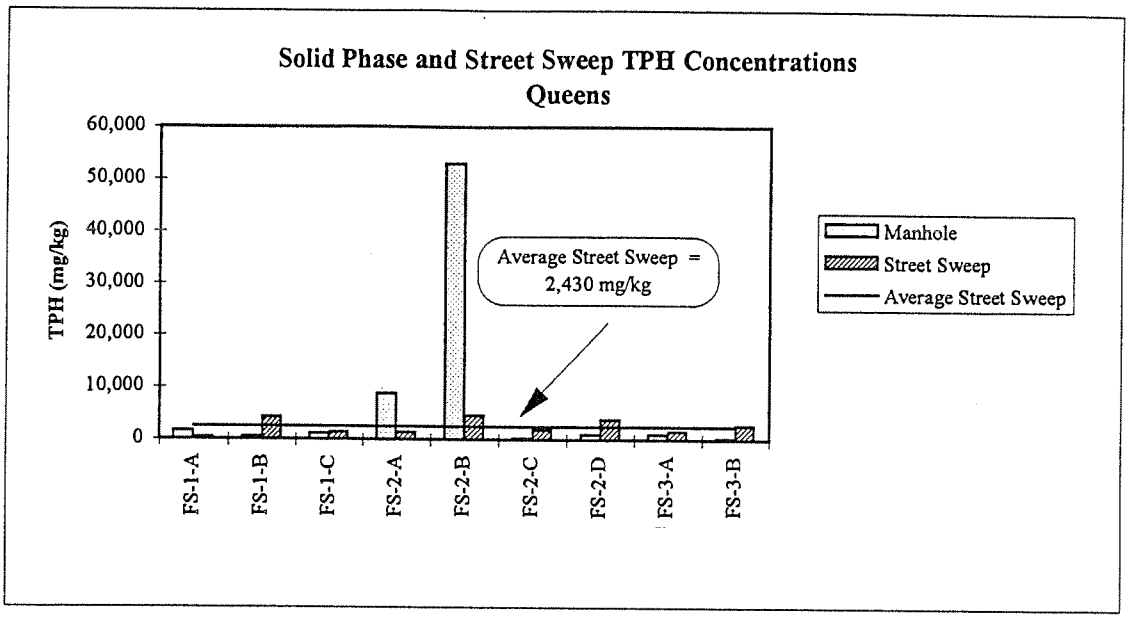

Solid Phase and Street Sweep Lead Concentrations
Queens
Lead (mg/kg)
12,000
10,000
8,000
6,000
4,000
2,000
0
Average Street Sweep = 456 mg/kg
Manhole
Street Sweep
Average Street Sweep
FS-1-A
FS-1-B
FS-1-C
FS-2-A
FS-2-B
FS-2-C
FS-2-D
FS-3-A
FS-3-B

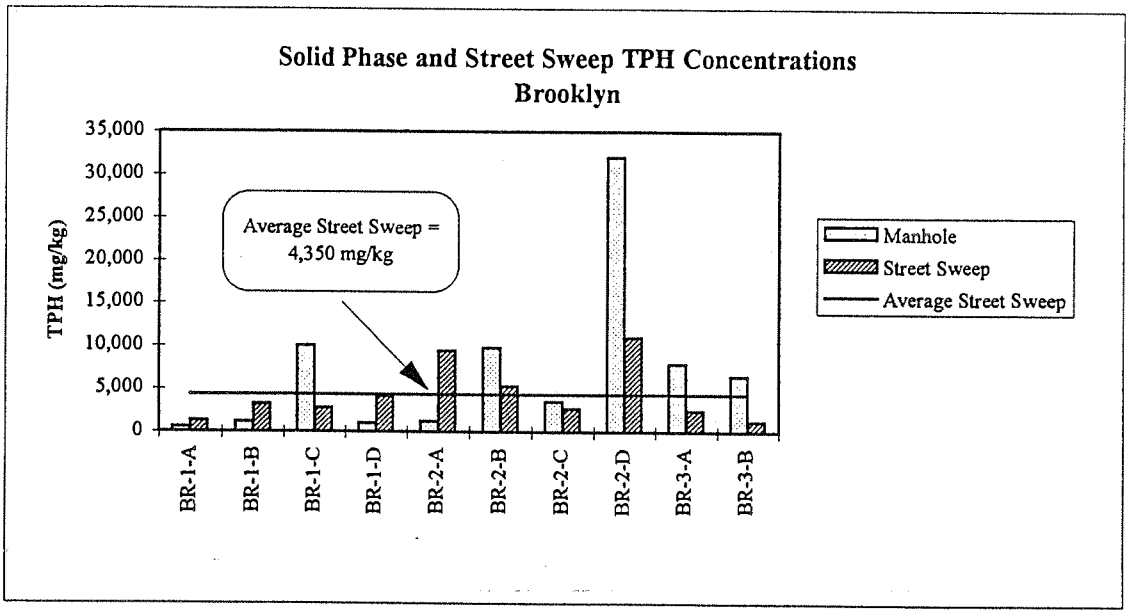

Solid Phase and Street Sweep Lead Concentrations
Brooklyn
Lead (mg/kg)
12,000
10,000
8,000
6,000
4,000
2,000
0
Average Street Sweep = 1,260 mg/kg
Manhole
Street Sweep
Average Street Sweep
BR-1-A
BR-1-B
BR-1-C
BR-1-D
BR-2-A
BR-2-B
BR-2-C
BR-2-D
BR-3-A
BR-3-B

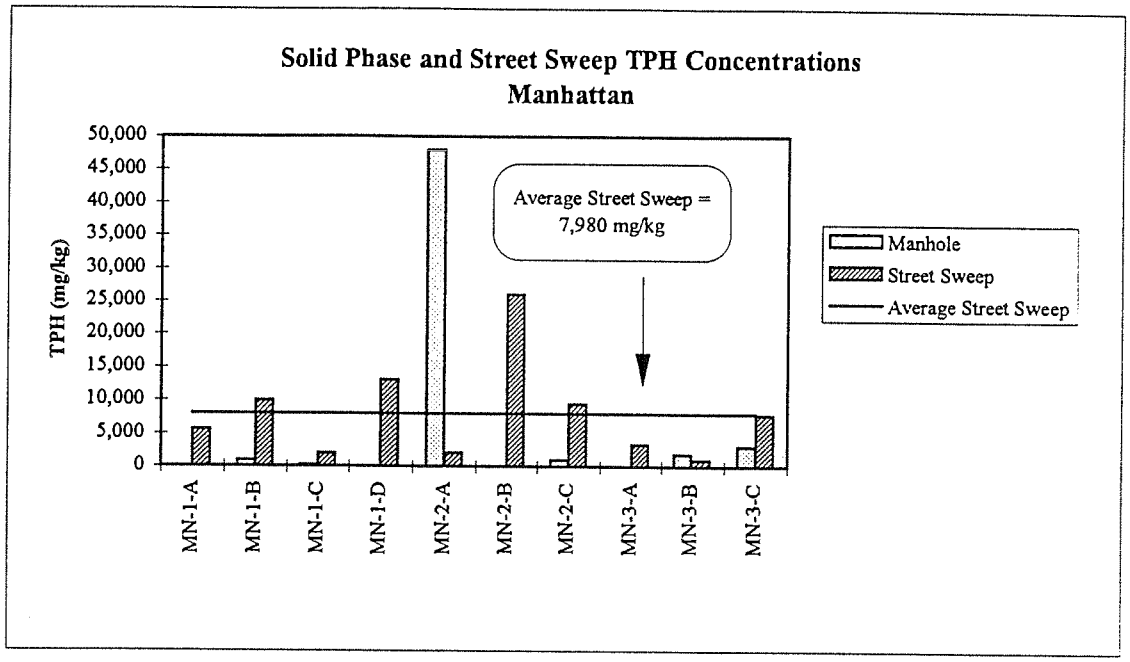

Solid Phase and Street Sweep Lead Concentrations
Manhattan
Lead (mg/kg)
10,000
8,000
6,000
4,000
2,000
0
Average Street Sweep = 684 mg/kg
Manhattan
Street Sweep
Average Street Sweep
MN-1-A
MN-1-B
MN-1-C
MN-1-D
MN-2-A
MN-2-B
MN-2-C
MN-3-A
MN-3-B
MN-3-C

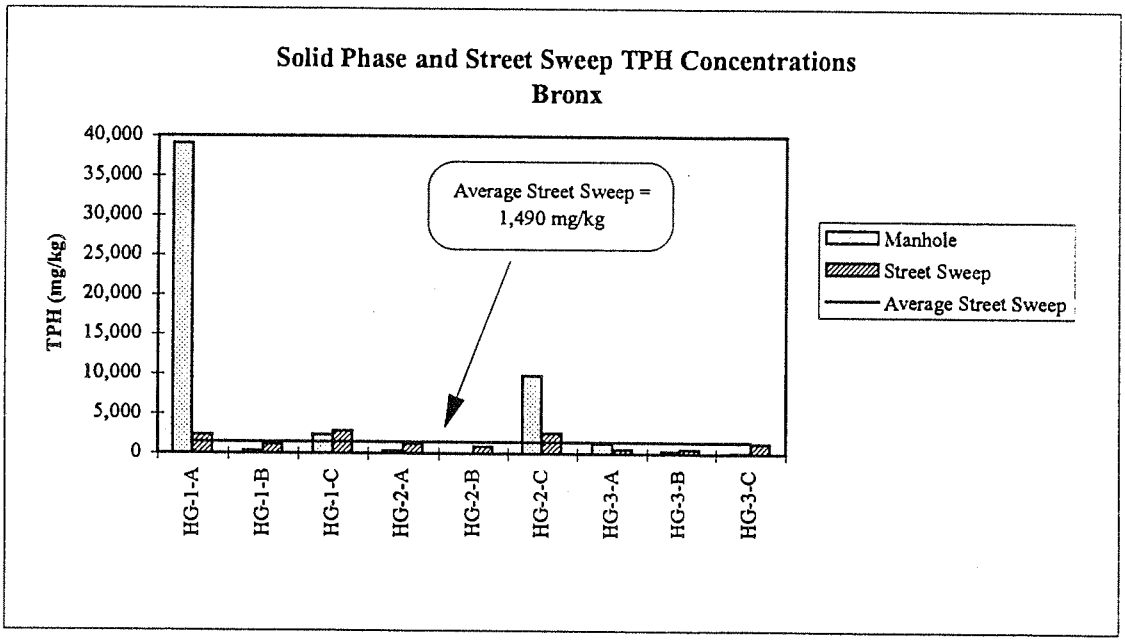

Solid Phase and Street Sweep Lead Concentrations
Bronx
Lead (mg/kg)
4,000
2,000
0
Average Street Sweep = 668 mg/kg
Manhattan
Street Sweep
Average Street Sweep
HG-1-A
HG-1-B
HG-1-C
HG-2-A
HG-2-B
HG-2-C
HG-3-A
HG-3-B
HG-3-C

Appendix G
Graphical Presentation of TPH in Solid-Phase and Street Sweep Samples


Solid Phase and Street Sweep TPH Concentrations
Queens
TPH (mg/kg)
60,000
50,000
40,000
30,000
20,000
10,000
0
Average Street Sweep = 2,430 mg/kg
Manhole
Street Sweep
Average Street Sweep
FS-1-A
FS-1-B
FS-1-C
FS-2-A
FS-2-B
FS-2-C
FS-2-D
FS-3-A
FS-3-B


Solid Phase and Street Sweep TPH Concentrations
Brooklyn
TPH (mg/kg)
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Average Street Sweep = 4,350 mg/kg
Manhole
Street Sweep
Average Street Sweep
BR-1-A
BR-1-B
BR-1-C
BR-1-D
BR-2-A
BR-2-B
BR-2-C
BR-2-D
BR-3-A
BR-3-B


Solid Phase and Street Sweep TPH Concentrations
Manhattan
TPH (mg/kg)
50,000
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Average Street Sweep = 7,980 mg/kg
MN-1-A
MN-1-B
MN-1-C
MN-1-D
MN-2-A
MN-2-B
MN-2-C
MN-3-A
MN-3-B
MN-3-C
Manhole
Street Sweep
Average Street Sweep


Solid Phase and Street Sweep TPH Concentrations
Bronx
TPH (mg/kg)
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Average Street Sweep = 1,490 mg/kg
HG-1-A
HG-1-B
HG-1-C
HG-2-A
HG-2-B
HG-2-C
HG-3-A
HG-3-B
HG-3-C
Manhole
Street Sweep
Average Street Sweep

Appendix H
Comparison of Average Solid-Phase to Truck Solids Concentrations

Comparison of Average Solid Phase Concentrations to Truck Solids Concentrations Queens							
		May 26, 1994		May 27, 1994		May 31, 1994	
Parameter	Units	Average Solid Phase	Truck Solids	Average Solid Phase	Truck Solids	Average Solid Phase	Truck Solids
Lead	mg/kg	997	570	388	420	5,549	19,000
TCLP Lead	mg/l	0.81	0.71	1.00	ND	ND	0.92
TPH	mg/kg	1,057	2,800	15,750	9,400	600	410
Solids	%	52	47	72	67	74	74
Total PCBs	mg/kg	1.26	0.93	1.74	1.55	0.76	1.42

Comparison of Average Solid Phase Concentrations to Truck Solids Concentrations Brooklyn							
		June 1, 1994		June 2, 1994		June 3, 1994	
Parameter	Units	Average Solid Phase	Truck Solids	Average Solid Phase	Truck Solids	Average Solid Phase	Truck Solids
Lead	mg/kg	5,278	670	753	980	885	680
TCLP Lead	mg/l	18.6	29	2.35	4.4	1.9	9.4
TPH	mg/kg	3,163	4,400	11,625	4,700	7,200	4,600
Solids	%	69	78	46	71	48	75
Total PCBs	mg/kg	19.8	1.34	0.23	0.25	1.51	0.76

Comparison of Average Solid Phase Concentrations to Truck Solids Concentrations Manhattan							
		June 9, 1994		June 10, 1994		June 10, 1994	
Parameter	Units	Average Solid Phase	Truck Solids	Average Solid Phase	Truck Solids	Average Solid Phase	Truck Solids
Lead	mg/kg	3,100	5,400	5,390	4,200	1,115	4,100
TCLP Lead	mg/l	14.3	7.7	4.00	12	1.2	11
TPH	mg/kg	530	9,300	24,500	48,000	2,400	32,000
Solids	%	39	44	60	27	65	27
Total PCBs	mg/kg	2.49	6.87	0.13	0.43	0.08	0.16

Comparison of Average Solid Phase Concentrations to Truck Solids Concentrations Bronx							
		July 12, 1994		July 14, 1994		July 15, 1994	
Parameter	Units	Average Solid Phase	Truck Solids	Average Solid Phase	Truck Solids	Average Solid Phase	Truck Solids
Lead	mg/kg	803	1,000	770	2,200	1,550	2,400
TCLP Lead	mg/l	1.60	4.6	1.2	2.1	7.6	2.1
TPH	mg/kg	13,887	2,100	5,070	1,300	558	440
Solids	%	65	61	53	49	73	48
Total PCBs	mg/kg	0.30	0.53	0.07	3.10	5.38	1.0

Average values calculated by substituting the reporting limit for those samples that were not detected

Appendix I
Waste Segregation Sampling Results

Table I-1
Solid-Phase Analytical Results
Staten Island

Sample ID	Sample Time	Type of Structure	TCLP Lead (mg/l)	
February 23, 1995				
SI-SP-1-T	9:02 AM	Transformer Vault	<0.50	ND
SI-SP-1-X	9:02 AM	Duplicate of SI-SP-1-T	<0.50	ND
SI-SP-2-M	9:17 AM	Manhole	2.9	
SI-SP-3-S	9:32 AM	Service Box	<0.50	ND
SI-SP-4-T	9:58 AM	Transformer Vault	<0.50	ND
SI-SP-5-M	10:08 AM	Manhole	<0.50	ND
SI-SP-6-T	10:35 AM	Transformer Vault	<0.50	ND
SI-SP-7-M	10:45 AM	Manhole	<0.50	ND
SI-SP-8-T	11:15 AM	Transformer Vault	<0.50	ND
SI-SP-9-M	11:25 AM	Manhole	<0.50	ND
SI-SP-10-T	11:51 AM	Transformer Vault	<0.50	ND
SI-SP-11-M	12:00 PM	Manhole	0.66	
SI-SP-12-T	1:15 PM	Transformer Vault	<0.50	ND
SI-SP-13-M	1:25 PM	Manhole	1.2	
SI-SP-14-S	2:10 PM	Service Box	<0.50	ND
SI-SP-15-T	2:26 PM	Transformer Vault	<0.50	ND
February 24, 1995				
SI-SP-16-S	9:05 AM	Service Box	<0.50	ND
SI-SP-2-X	9:05 AM	Duplicate of SI-SP-16-S	<0.50	ND
SI-SP-17-S	9:15 AM	Service Box	<0.50	ND
SI-SP-18-T	9:35 AM	Transformer Vault	1.4	
SI-SP-19-M	9:50 AM	Manhole	<0.50	ND
SI-SP-20-M	10:20 AM	Manhole	5.4	
SI-SP-21-S	10:30 AM	Service Box	<0.50	ND
SI-SP-22-S	10:40 AM	Service Box	0.73	
SI-SP-23-T	10:45 AM	Transformer Vault	0.97	
SI-SP-24-S	11:35 AM	Service Box	7.0	
SI-SP-25-S	11:12 AM	Service Box	<0.50	ND
SI-SP-26-M	11:50 AM	Manhole	27	
SI-SP-27-T	12:20 PM	Transformer Vault	<0.50	ND

ND - Analyzed for but not detected
Values greater than the TCLP lead regulatory level of 5 mg/l are shaded

Table I-2 Solid-Phase Analytical Results Westchester			
Sample ID	**Sample Time**	**Type of Structure**	**TCLP Lead (mg/l)**
February 16, 1995			
WC-SP-1-S	9:00 AM	Service Box	<0.50 ND
WC-SP-1-X	9:20 AM	Duplicate of WC-SP-1-S	<0.50 ND
WC-SP-2-M	10:00 AM	Manhole	0.71
WC-SP-3-T	10:20 AM	Transformer Vault	1.0
WC-SP-4-M	11:30 AM	Manhole	140
WP-SP-5-T	11:50 AM	Transformer Vault	2.6
WC-SP-6-S	12:10 PM	Service Box	<0.50 ND
WP-SP-7-M	1:22 PM	Manhole	450
WC-SP-8-T	1:45 PM	Transformer Vault	4.7
WC-SP-9-S	2:00 PM	Service Box	<0.50 ND
February 17, 1995			
WC-SP-10-M	9:35 AM	Manhole	<0.50 ND
WC-SP-2-X	9:35 AM	Duplicate of WC-SP-2-X	<0.50 ND
WC-SP-11-T	10:00 AM	Transformer Vault	<0.50 ND
WC-SP-12-S	10:20 AM	Service Box	1.6
WC-SP-13-M	11:35 AM	Manhole	2.7
WC-SP-14-T	11:50 AM	Transformer Vault	<0.50 ND
WC-SP-15-S	12:15 PM	Service Box	0.85
WC-SP-16-M	1:55 PM	Manhole	6.8
WC-SP-17-S	2:10 PM	Service Box	<0.50 ND
WC-SP-18-T	2:30 PM	Transformer Vault	14

ND - Analyzed for but not detected
Values greater than the TCLP lead regulatory level of 5 mg/l are shaded

Table I-3 Solid-Phase Analytical Results Queens			
Sample ID	**Sample Time**	**Type of Structure**	**TCLP Lead (mg/l)**
March 6, 1995			
FS-SP-1-T	8:40 AM	Transformer Vault	<0.50 ND
FS-SP-2-M	8:48 AM	Manhole	66
FS-SP-3-S	8:56 AM	Service Box	1.2
FS-SP-1-X	8:56 AM	Duplicate of FS-SP-3-S	0.77
FS-SP-4-T	9:18 AM	Transformer Vault	<0.50 ND
FS-SP-5-S	9:28 AM	Service Box	<0.50 ND
FS-SP-6-M	9:36 AM	Manhole	0.71
FS-SP-7-S	10:17 AM	Service Box	0.80
FS-SP-8-S	10:24 AM	Service Box	<0.50 ND
FS-SP-9-T	10:42 AM	Transformer Vault	<0.50 ND
FS-SP-10-T	11:44 AM	Transformer Vault	<0.50 ND
FS-SP-11-M	11:52 AM	Manhole	2.6
FS-SP-12-T	12:42 PM	Transformer Vault	<0.50 ND
FS-SP-13-M	1:10 PM	Manhole	7.5
FS-SP-14-M	1:38 PM	Manhole	58
March 7, 1995			
FS-SP-15-T	8:35 AM	Transformer Vault	4.1
FS-SP-16-M	8:45 AM	Manhole	10
FS-SP-2-X	8:45 AM	Duplicate of FS-SP-16-M	12
FS-SP-17-T	9:20 AM	Transformer Vault	0.54
FS-SP-18-S	9:24 AM	Service Box	0.52
FS-SP-19-M	9:35 AM	Manhole	370
FS-SP-20-S	9:55 AM	Service Box	0.56
FS-SP-21-T	10:15 AM	Transformer Vault	2.4
FS-SP-22-M	10:30 AM	Manhole	4.5
FS-SP-23-S	10:36 AM	Service Box	<0.50 ND
FS-SP-24-T	11:12 AM	Transformer Vault	<0.50 ND
FS-SP-25-M	11:20 AM	Manhole	180
FS-SP-26-S	11:30 AM	Service Box	3
FS-SP-27-S	12:35 PM	Service Box	2.5
FS-SP-28-M	12:40 PM	Manhole	30

ND - Analyzed for but not detected
Values greater than the TCLP lead regulatory level of 5 mg/l are shaded

Table I-3 Solid-Phase Analytical Results Queens			
Sample ID	**Sample Time**	**Type of Structure**	**TCLP Lead (mg/l)**
March 7, 1995 (cont'd)			
FS-SP-29-T	1:10 PM	Transformer Vault	1.3
FS-SP-30-T	1:30 PM	Transformer Vault	7.5
FS-SP-31-S	1:45 PM	Service Box	5.7
FS-SP-32-M	2:00 PM	Manhole	12
March 8, 1995			
FS-SP-33-T	8:55 AM	Transformer Vault	<0.50 ND
FS-SP-34-M	9:05 AM	Manhole	<0.50 ND
FS-SP-3-X	9:05 AM	Duplicate of FS-SP-34-M	<0.50 ND
FS-SP-35-T	9:21 AM	Transformer Vault	<0.50 ND
FS-SP-36-M	9:32 AM	Manhole	<0.50 ND
FS-SP-37-S	9:44 AM	Service Box	0.66
FS-SP-38-T	10:14 AM	Transformer Vault	1.1
FS-SP-39-M	10:27 AM	Manhole	11
FS-SP-40-S	10:35 AM	Service Box	0.53
FS-SP-41-T	11:15 AM	Transformer Vault	0.80
FS-SP-42-M	11:26 AM	Manhole	3.8
FS-SP-43-T	12:25 PM	Transformer Vault	0.51
FS-SP-44-S	12:35 PM	Service Box	<0.50 ND
FS-SP-45-T	1:28 PM	Transformer Vault	<0.50 ND
FS-SS-46-SS	1:33 PM	Street sweep	0.50 ND
FS-SP-47-M	1:46 PM	Manhole	1.1
FS-SP-48-S	2:07 PM	Service Box	<0.50 ND

ND - Analyzed for but not detected
Values greater than the TCLP lead regulatory level of 5 mg/l are shaded

Table I-4 Solid-Phase Analytical Results Brooklyn			
Sample ID	**Sample Time**	**Type of Structure**	**TCLP Lead (mg/l)**
March 20, 1995			
BR-SP-1-T	9:13 AM	Transformer Vault	<0.50 ND
BR-SP-2-S	9:28 AM	Service Box	0.95
BR-SP-1-X	9:28 AM	Duplicate of BR-SP-1-S	1.2
BR-SP-3-S	9:52 AM	Service Box	3.4
BR-SP-4-T	10:07 AM	Transformer Vault	<0.50 ND
BR-SP-5-T	10:28 AM	Transformer Vault	<0.50 ND
BR-SP-6-S	10:39 AM	Service Box	<0.50 ND
BT-SP-7-T	10:55 AM	Transformer Vault	0.57
BR-SP-8-S	11:11 AM	Service Box	3.3
BR-SP-9-SS	11:21 AM	Street sweep	45
BR-SP-10-T	11:37 AM	Transformer Vault	3.6
BR-SP-11-S	11:58 AM	Service Box	3.9
BR-SP-12-T	12:16 PM	Transformer Vault	0.55
BR-SP-13-S	12:26 PM	Service Box	<0.50 ND
BR-SP-14-T	1:33 PM	Transformer Vault	<0.50 ND
BR-SP-15-S	1:40 PM	Service Box	0.76
BR-SP-16-T	1:56 PM	Transformer Vault	0.79
BR-SP-17-S	2:15 PM	Service Box	<0.50 ND
BR-SP-18-S	2:35 PM	Service Box	2.0
BR-SP-19-T	2:50 PM	Transformer Vault	1.2
BR-SP-20-T	3:44 PM	Transformer Vault	<0.50 ND
BR-SP-21-S	3:50 PM	Service Box	<0.50 ND
BR-SP-22-T	4:19 PM	Transformer Vault	<0.50 ND
BR-SP-23-S	4:30 PM	Service Box	1.3

ND - Analyzed for but not detected
Values greater than the TCLP lead regulatory level of 5 mg/l are shaded

Table I-4 Solid-Phase Analytical Results Brooklyn			
Sample ID	**Sample Time**	**Type of Structure**	**TCLP Lead (mg/l)**
March 21, 1995			
BR-SP-24-T	8:50 AM	Transformer Vault	0.99
BR-SP-2-X	8:50 AM	Duplicate of BR-SP-24-T	0.79
BR-SP-25-S	9:20 AM	Service Box	<0.50 ND
BR-SP-26-T	9:45 AM	Transformer Vault	0.86
BR-SP-27-S	9:57 AM	Service Box	1.6
BR-SP-28-T	10:25 AM	Transformer Vault	1.1
BR-SP-29-S	10:35 AM	Service Box	2.8
BR-SP-30-S	11:00 AM	Service Box	4.7
BR-SP-31-T	11:25 AM	Transformer Vault	<0.50 ND
BR-SP-32-T	12:15 PM	Transformer Vault	<0.50 ND
BR-SP-33-S	12:24 PM	Service Box	0.55
BR-SP-34-T	12:50 PM	Transformer Vault	<0.50 ND
BR-SP-35-S	1:14 PM	Service Box	2.9
BR-SP-36-T	1:30 PM	Transformer Vault	<0.50 ND
BR-SP-37-T	2:04 PM	Transformer Vault	<0.50 ND
BR-SP-38-S	2:25 PM	Service Box	1.1
BR-SP-39-T	2:58 PM	Transformer Vault	0.51
BR-SP-40-S	3:07 PM	Service Box	2.1
BR-SP-41-T	3:35 PM	Transformer Vault	9.4
BR-SP-42-S	3:40 PM	Service Box	110

ND - Analyzed for but not detected
Values greater than the TCLP lead regulatory level of 5 mg/l are shaded

Table I-5
Solid-Phase Analytical Results
Manhattan

Sample ID	Sample Time	Type of Structure	TCLP Lead (mg/l)
March 20, 1995			
MN-SP-1-S	8:30 AM	Service Box	0.96
MN-SP-2-S	8:40 AM	Service Box	0.91
MN-SP-2-X	8:40 AM	Duplicate of MN-SP-2-S	0.80
MN-SP-3-T	9:00 AM	Transformer Vault	2.1
MN-SP-4-T	9:10 AM	Transformer Vault	<0.50 ND
MN-SP-5-S	9:30 AM	Service Box	<0.50 ND
MN-SP-6-V	9:40 AM	Transformer Vault	<0.50 ND
MN-SP-7-V	11:00 AM	Transformer Vault	<0.50 ND
MN-SP-8-S	11:10 AM	Service Box	<0.50 ND
MN-SP-9-V	12:15 PM	Transformer Vault	<0.50 ND
MN-SP-10-S	12:20 PM	Service Box	<0.50 ND
MN-SP-11-V	1:05 PM	Transformer Vault	0.92
MN-SP-12-S	1:15 PM	Service Box	720
March 21, 1995			
MN-SP-13-T	8:20 AM	Transformer Vault	2.8
MN-SP-1-X	8:20 AM	Duplicate of MN-SP-13-T	1.4
MN-SP-14-S	8:25 AM	Service Box	1.5
MN-SP-15-S	9:10 AM	Service Box	5.7
MN-SP-16-T	9:15 AM	Transformer Vault	<0.50 ND
MN-SP-17-T	9:50 AM	Transformer Vault	0.75
MN-SP-18-S	9:55 AM	Service Box	3.7
MN-SP-19-T	10:10 AM	Transformer Vault	<0.50 ND
MN-SP-20-S	10:15 AM	Service Box	<0.50 ND
MN-SP-21-S	11:00 AM	Service Box	2.0
MN-SP-22-T	11:05 AM	Transformer Vault	0.59
March 22, 1995			
MN-SP-23-T	8:50 AM	Transformer Vault	<0.50 ND
MN-SP-24-S	9:00 AM	Service Box	0.60
MN-SP-3-X	9:00 AM	Duplicate of MN-SP-24-S	0.57
MN-SP-25-T	9:30 AM	Transformer Vault	<0.50 ND
MN-SP-26-S	9:45 AM	Service Box	<0.50 ND
MN-SP-27-T	10:10 AM	Transformer Vault	<0.50 ND
MN-SP-28-S	10:20 AM	Service Box	63
MN-SP-29-T	11:35 AM	Transformer Vault	4.8
MN-SP-30-S	11:45 AM	Service Box	17
MN-SP-31-T	12:10 PM	Transformer Vault	1.1
MN-SP-32-S	12:15 PM	Service Box	2.3

ND - Analyzed for but not detected
Values greater than the TCLP lead regulatory level of 5 mg/l are shaded

Table I-6 Solid-Phase Analytical Results The Bronx			
Sample ID	**Sample Time**	**Type of Structure**	**TCLP Lead (mg/l)**
March 23, 1995			
HG-SP-1-S	8:30 AM	Service Box	0.60
HG-SP-1-X	8:30 AM	Duplicate of HG-SP-1-S	<0.50 ND
HG-SP-2-T	8:45 AM	Transformer Vault	0.93
HG-SP-3-T	9:10 AM	Transformer Vault	0.62
HG-SP-4-T	9:20 AM	Transformer Vault	4.3
HG-SP-5-T	9:55 AM	Transformer Vault	<0.50 ND
HG-SP-6-S	10:05 AM	Service Box	<0.50 ND
HG-SP-7-T	10:47 AM	Transformer Vault	<0.50 ND
HG-SP-8-S	11:10 AM	Service Box	0.54
HG-SP-9-T	11:45 AM	Transformer Vault	4.7
HG-SP-10-S	11:55 AM	Service Box	<0.50 ND
HG-SP-11-S	12:20 PM	Service Box	0.75
HG-SP-12-T	12:25 PM	Transformer Vault	<0.50 ND
HG-SP-13-T	13:35 PM	Transformer Vault	<0.50 ND
HG-SP-14-S	13:40 PM	Service Box	0.54
HG-SP-15-S	14:10 PM	Service Box	<0.50 ND
HG-SP-16-T	14:20 PM	Transformer Vault	<0.50 ND
HG-SP-17-T	14:45 PM	Transformer Vault	<0.50 ND
HG-SP-18-S	14:55 PM	Service Box	<0.50 ND
March 24, 1995			
HG-SP-19-T	8:40 AM	Transformer Vault	<0.50 ND
HG-SP-2-X	8:40 AM	Duplicate of HG-SP-19-T	<0.50 ND
HG-SP-20-T	9:20 AM	Transformer Vault	<0.50 ND
HG-SP-21-S	9:35 AM	Service Box	<0.50 ND
HG-SP-22-S	10:10 AM	Service Box	0.66
HG-SP-23-T	10:20 AM	Transformer Vault	1.2
HG-SP-24-S	10:45 AM	Service Box	<0.50 ND
HG-SP-25-T	10:50 AM	Transformer Vault	0.56
HG-SP-26-T	11:05 AM	Transformer Vault	2.9
HG-SP-27-S	11:10 AM	Service Box	<0.50 ND
HG-SP-28-T	11:40 AM	Transformer Vault	3.0
HG-SP-29-S	11:55 AM	Service Box	5.6
HG-SP-30-S	12:30 PM	Service Box	<0.50 ND
HG-SP-31-T	12:35 PM	Transformer Vault	<0.50 ND
HG-SP-32-T	13:50 PM	Transformer Vault	<0.50 ND
HG-SP-33-S	13:55 PM	Service Box	<0.50 ND
HG-SP-34-T	14:15 PM	Transformer Vault	<0.50 ND
HG-SP-35-S	14:20 PM	Service Box	<0.50 ND

ND - Analyzed for but not detected
Values greater than the TCLP lead regulatory level of 5 mg/l are shaded

Table I-7 Solid-Phase Analytical Results Equipment Blanks				
Sample ID	**Sample Date**	**Sample Time**	**TCLP Lead (mg/l)**	
WC-SP-EB-1	2/16/95	11:14 AM	0.50	ND
WC-SP-EB-2	2/17/95	2:20 PM	0.50	ND
FS-SP-EB-1	3/6/95	1:20 PM	0.50	ND
FS-SP-EB-2	3/7/95	12:50 PM	0.50	ND
FS-SP-EB-3	3/8/95	8:10 AM	0.50	ND
SI-SP-EB-1	2/23/95	7:35 AM	0.50	ND
SI-SP-EB-2	2/24/95	8:05 AM	0.50	ND
BR-SP-EB-1	3/20/95	8:16 AM	0.50	ND
BR-SP-EB-1	3/21/95	8:30 AM	0.50	ND
MN-SP-EB-1	3/20/95	8:55 AM	0.50	ND
MN-SP-EB-2	3/21/95	7:30 AM	0.50	ND
MN-SP-EB-3	3/21/95	7:35 AM	0.50	ND
HG-SP-EB-1	3/23/95	7:35 AM	0.50	ND
HG-SP-EB-2	3/24/95	7:35 AM	0.50	ND

Appendix J
Structural Information for Waste Segregation Sampling

Structure Summary Staten Island								
CH2M HILL ID Number	Con Edison Structure Number	Type of Structure	Address	Lead Present			Lead Joints Present	Date Transformer Installed
				Primary	Secondary	Service		
SI-SP-1-T	VS9332	Transformer Vault	Yukon Ave. - In Front of Bus Depot	Yes	No	---	Yes	6/24/80
SI-SP-2-M	M4815	Manhole	Yukon Ave. - Behind K-Mart	Yes	No	---	No	---
SI-SP-3-S	6816	Service Box	Independence & Richmond Ave.	---	No	No	No	---
SI-SP-4-T	VS8366	Transformer Vault	Windham Loop	Yes	No	---	Yes	1/3/76
SI-SP-5-M	M4396	Manhole	Windham Loop	Yes	No	---	Yes	---
SI-SP-6-T	VS7593	Transformer Vault	Nedra La.	Yes	No	---	No	9/18/90
SI-SP-7-M	M6957	Manhole	Nedra La.	Yes	No	---	Yes	---
SI-SP-8-T	V7459	Transformer Vault	Luten Ave.	Yes	No	---	Yes	4/15/71
SI-SP-9-M	M1408	Manhole	Luten Ave.	Yes	No	---	Yes	---
SI-SP-10-T	V7134	Transformer Vault	Mill Rd. near Isernia Ave.	Yes	No	---	Yes	6/6/68
SI-SP-11-M	M970	Manhole	Mill Rd. near Isernia Ave.	Yes	No	---	Yes	---
SI-SP-12-T	VS7836	Transformer Vault	Capodanno Blvd. near Robin Rd.	Yes	No	---	Yes	4/5/71
SI-SP-13-M	M2117	Manhole	Capodanno Blvd. near Robin Rd.	No	No	---	No	---
SI-SP-14-S	3231	Service Box	Corner of Steuben & Weser	---	No	No	No	---
SI-SP-15-T	VS8155	Transformer Vault	Corner of Steuben & Elbe	Yes	No	---	Yes	3/1/95
SI-SP-16-S	211	Service Box	143 New St.	---	No	No	No	---
SI-SP-17-S	206	Service Box	167 Port Richmond Ave.	---	No	No	No	---
SI-SP-18-T	VS297	Transformer Vault	Harrison & Port Richmond Ave.	Yes	Yes	---	Yes	4/27/93
SI-SP-19-M	M214	Manhole	Harrison & Port Richmond Ave.	Yes	No	---	Yes	---
SI-SP-20-M	M157	Manhole	25 Hyatt St.	Yes	Yes	---	Yes	---
SI-SP-21-S	6838	Service Box	10 Hyatt St.	---	No	No	No	---
SI-SP-22-S	156	Service Box	Hyatt St. Across from Library	---	No	No	No	---
SI-SP-23-T	VS305	Transformer Vault	Hyatt St.	Yes	No	---	Yes	6/15/91
SI-SP-24-S	1059	Service Box	Corner of Bay & Slosson	---	No	No	No	---
SI-SP-25-S	171	Service Box	Bay Ave.	---	No	No	No	---
SI-SP-26-M	M648	Manhole	Corner of Renwick & Milford	Yes	No	---	Yes	---
SI-SP-27-T	V7014	Transformer Vault	Staten Island College	Yes	Yes	---	Yes	10/19/66

--- - Not Applicable

Structure Summary Westchester								
				Lead Present				
CH2M HILL ID Number	Con Edison Structure Number	Type of Structure	Address	Primary	Secondary	Service	Lead Joints Present	Date Transformer Installed
WC-SP-1-S	SB3244	Service Box	Manchester & Woodlot	---	No	No	Yes	---
WC-SP-2-M	MH3243	Manhole	Woodlot Rd.	Yes	No	---	No	---
WC-SP-3-T	TM4314	Transformer Vault	Woodlot Rd.	Yes	No	---	No	Unknown
WC-SP-4-M	MH8440	Manhole	Central Park Ave.	Yes	No	No	Yes	---
WP-SP-5-T	TM320	Transformer Vault	Central Park Ave.	Yes	No	---	No	Unknown
WC-SP-6-S	SB8442	Service Box	Central Park Ave.	---	No	No	No	---
WP-SP-7-M	MH8247	Manhole	S. Broadway & St. Mary's St.	Yes	No	No	No	---
WC-SP-8-T	V7904	Transformer Vault	S. Broadway & St. Mary's St.	Yes	No	---	No	10/6/93
WC-SP-9-S	SB885	Service Box	St. Mary's St.	---	---	No	No	---
WC-SP-10-M	MH992	Manhole	Parkview Ave. & Garrett Pl.	Yes	No	---	Yes	---
WC-SP-11-T	TM 998	Transformer Vault	Garrett Pl.	Yes	No	---	No	Unknown
WC-SP-12-S	SB267	Service Box	Garrett Pl.	---	No	Yes	No	---
WC-SP-13-M	MH1655	Manhole	Main & S. Washington	Yes	No	No	Yes	---
WC-SP-14-T	VS7710	Transformer Vault	Main & S. Washington	Yes	No	---	No	10/7/85
WC-SP-15-S	SB1652	Service Box	28 Main	---	No	Yes	No	---
WC-SP-16-M	MH9923	Manhole	Bank St.	Yes	No	No	Yes	---
WC-SP-17-S	SB9964	Service Box	Bank St.	---	No	No	No	---
WC-SP-18-T	TM5329	Transformer Vault	Bank St.	Yes	No	---	No	5/27/87

Structure Summary Queens								
				Lead Present				
CH2M HILL ID Number	Con Edison Structure Number	Type of Structure	Address	Primary	Secondary	Service	Lead Joints Present	Date Installed
FS-SP-1-T	VS7672	Transformer Vault	58th Ave NE Queens HS	No	No	---	No	1966
FS-SP-2-M	M16810	Manhole	58th Ave NE Queens HS	No	---	---	No	---
FS-SP-3-S	63066	Service Box	58th Ave NE Queens HS	---	No	No	No	---
FS-SP-4-T	VS8213	Transformer Vault	73rd Ave. & 225th St.	No	No	---	No	1969
FS-SP-5-S	54481	Service Box	73rd Ave. & 225th St.	---	---	No	No	---
FS-SP-6-M	M18138	Manhole	73rd Ave. & 225th St.	No	No	---	No	---
FS-SP-7-S	71960	Service Box	110-54 Springfield Ave.	---	---	No	No	---
FS-SP-8-S	65802	Service Box	111-36 Springfield Ave.	---	---	No	No	---
FS-SP-9-T	TM6689	Transformer Vault	227th St. & 115 Rd.	No	No	---	No	1993
FS-SP-10-T	VS1101	Transformer Vault	Byrnes Ave. & 169 St.	Yes	No	---	Yes	1959
FS-SP-11-M	M12884	Manhole	Byrnes Ave. & 169 St.	No	No	---	No	---
FS-SP-12-T	VS5203	Transformer Vault	151st Ave. near 89th St.	No	No	---	No	1975
FS-SP-13-M	M12058	Manhole	151st Ave. near 88th St.	No	No	---	No	---
FS-SP-14-M	M18521	Manhole	153rd Ave. & 88th St.	No	No	---	No	---
FS-SP-15-T	VS6405	Transformer Vault	Grand Ave. & 69th Lane	Yes	No	---	No	1962
FS-SP-16-M	M14551	Manhole	69-75 Grand Ave.	Yes	No	---	No	---
FS-SP-17-T	VS8679	Transformer Vault	Cypress & Hancock	Yes	No	---	No	1973
FS-SP-18-S	9389	Service Box	Cypress & Hancock	---	---	No	No	---
FS-SP-19-M	M14549	Manhole	Cypress & Hancock	Yes	No	---	No	---
FS-SP-20-S	9700	Service Box	Wyckoff & Weirfield	---	---	No	No	---
FS-SP-21-T	TM7262	Transformer Vault	Woodbine St. & Myrtle	Yes	Yes	---	?*	1977
FS-SP-22-M	M658	Manhole	Woodbine St. & Myrtle	Yes	No	No	No	---
FS-SP-23-S	102	Service Box	Woodbine St. & Myrtle	---	---	No	No	---
FS-SP-24-T	V5290	Transformer Vault	Review Ave. & 37th St.	Yes	No	---	No	1974
FS-SP-25-M	157	Manhole	Review Ave. & 37th St.	Yes	No	---	Yes	---
FS-SP-26-S	25595	Service Box	53-34 37th St.	---	---	No	No	---
FS-SP-27-S	13142	Service Box	47th & 5th St.	---	---	No	No	---
FS-SP-28-M	659	Manhole	48th & 5th St.	Yes	---	---	No	---
FS-SP-29-T	TM3048	Transformer Vault	36th Ave. & 11th St.	No	No	---	No	1986

Structure Summary Queens								
				Lead Present				
CH2M HILL ID Number	Con Edison Structure Number	Type of Structure	Address	Primary	Secondary	Service	Lead Joints Present	Date Installed
FS-SP-30-T	TM6597	Transformer Vault	21st Ave. & 24th St.	Yes	No	---	No	1975
FS-SP-31-S	53953	Service Box	20th Ave. & 24th St.	---	---	No	No	---
FS-SP-32-M	M310	Manhole	20th Ave. & 28th St.	Yes	Yes	---	No	---
FS-SP-33-T	VS8782	Transformer Vault	39th Avenue	No	No	---	No	1973
FS-SP-34-M	M19512	Manhole	136-52 39th	No	No	---	No	---
FS-SP-35-T	VS935	Transformer Vault	Main St. near 63rd Ave.	No	No	---	No	1989
FS-SP-36-M	M16109	Manhole	Main St. near 63rd Ave.	No	No	---	No	---
FS-SP-37-S	66977	Service Box	63rd Ave. near Main St.	---	---	No	No	---
FS-SP-38-T	V294	Transformer Vault	56th Ave. near 90th St.	No	No	---	Yes	1965
FS-SP-39-M	M16553	Manhole	90th St. near 56th	No	No	---	No	---
FS-SP-40-S	63632	Service Box	90th St. & Justice Ave.	---	---	No	No	---
FS-SP-41-T	1046	Transformer Vault	Roosevelt & Britton Ave.	No	No	---	No	1958
FS-SP-42-M	1974	Manhole	Roosevelt & Britton Ave.	No	No	---	No	---
FS-SP-43-T	VS545	Transformer Vault	Leverich near 35th Ave.	No	No	---	No	1992
FS-SP-44-S	95790	Service Box	Corner Leverich & 35 Ave.	---	---	No	No	---
FS-SP-45-T	VS454	Transformer Vault	Hoyt Ave. S. & 26 St.	No	No	---	No	1964
FS-SP-47-M	M3886	Manhole	Crescent St. near Hoyt Ave. S.	No	No	---	No	---
FS-SP-48-S	63670	Service Box	Infront of Farrington St. Dump	---	---	No	No	---

• Con Ed field personel was unsure if lead joints were present.

--- - Not Applicable

Notes:

Sample FS-SP-46-SS was collected as a street sweep sample and was not presented in this table.

Structure Summary Brooklyn								
				Lead Present				
CH2M HILL ID Number	Con Edison Structure Number	Type of Structure	Address	Primary	Secondary	Service	Lead Joints Present	Year Transformer Installed
BR-SP-1-T	TM 1996	Transformer Vault	Otsego & Wolcott	Yes	No	---	No	1993
BR-SP-2-S	17577	Service Box	Dwight & Wolcott	---	No	No	No	---
BR-SP-3-S	22564	Service Box	Carroll St. & Van Brunt St.	---	No	No	No	---
BR-SP-4-T	TM 2510	Transformer Vault	Carroll St. & Van Brunt St.	Yes	No	---	No	1993
BR-SP-5-T	V5420	Transformer Vault	Hicks St. & Joraleman St.	Yes	No	---	No	1990
BR-SP-6-S	9254	Service Box	Hicks St. & Joraleman St.	---	No	No	No	---
BT-SP-7-T	V4401	Transformer Vault	Pearl St. & Prospect St.	Yes	No	---	No	1967
BR-SP-8-S	61228	Service Box	Prospect & Jay St.	---	No	Yes	No	---
BR-SP-10-T	VS3316	Transformer Vault	Rush St.& Kent Ave.	Yes	No	---	No	1960
BR-SP-11-S	62512	Service Box	Morton St. & Kent Ave.	---	Yes	No	Yes	---
BR-SP-12-T	VS5059	Transformer Vault	Roebling St. & N. 7th St.	Yes	No	---	No	1995
BR-SP-13-S	30129	Service Box	Roebling St. & N. 7th St.	---	Yes	Yes	Yes	---
BR-SP-14-T	VS3496	Transformer Vault	Meserole & Humbolt St.	Yes	No	---	No	1991
BR-SP-15-S	63573	Service Box	Meserole & Humbolt St.	---	No	No	No	---
BR-SP-16-T	V5593	Transformer Vault	Morgan Ave. & Division	Yes	No	---	No	1972
BR-SP-17-S	16093	Service Box	Morgan Ave. & Frost St.	---	No	No	No	---
BR-SP-18-S	28586	Service Box	Ingraham & Gardner	---	No	No	No	---
BR-SP-19-T	VS5263	Transformer Vault	Ingraham & Gardner	Yes	No	---	No	1980
BR-SP-20-T	V4830	Transformer Vault	Strauss & E. 98th	Yes	No	---	No	1994
BR-SP-21-S	58601	Service Box	601 Strauss	---	No	No	No	---
BR-SP-22-T	V7571	Transformer Vault	Clarkson & Schenectady	Yes	No	---	No	1992
BR-SP-23-S	21859	Service Box	Clarkson & E. 46th St.	---	No*	No*	No*	---
BR-SP-24-T	V3148	Transformer Vault	30th St. & 3rd Ave.	Yes	No	---	No	1986
BR-SP-25-S	48176	Service Box	3rd Ave. & 46th St.	---	No	No	No	---
BR-SP-26-T	4303	Transformer Vault	3rd Ave. & 91st St.	Yes	No	---	No	1966
BR-SP-27-S	53961	Service Box	265 91st St.	---	No	No	No	---
BR-SP-28-T	5013	Transformer Vault	86th St. & Bay 19th	Yes	No	---	No	1969
BR-SP-29-S	40240	Service Box	86th St. & Bay 19th	---	Yes	No	Yes	---
BR-SP-30-S	40735	Service Box	Bowery & W. 15th	---	Yes	Yes	Yes	---

Structure Summary Brooklyn								
				Lead Present				
CH2M HILL ID Number	Con Edison Structure Number	Type of Structure	Address	Primary	Secondary	Service	Lead Joints Present	Year Transformer Installed
BR-SP-31-T	VS3488	Transformer Vault	Surf Ave. & Stillwell	Yes	No	---	No	1988
BR-SP-32-T	VS3762	Transformer Vault	1360 Ocean Pkwy.	Yes	No	---	No	1963
BR-SP-33-S	37061	Service Box	Ocean Pkwy. & Ave. N	---	No	No	No	---
BR-SP-34-T	VS5052	Transformer Vault	Ave. L & E. 56th St.	Yes	No	---	No	1972
BR-SP-35-S	71689	Service Box	Glenwood Rd. & E 86th St.	---	No	No	No	---
BR-SP-36-T	VS5876	Transformer Vault	Glenwood Rd. & 86th St.	Yes	No	---	No	1976
BR-SP-37-T	1048	Transformer Vault	Bushwick Ave. & Fanchon	Yes	No	---	No	1981
BR-SP-38-S	22156	Service Box	Fanchon & Highland Blvd.	---	Yes	Yes	Yes	---
BR-SP-39-T	4003	Transformer Vault	Stuyvesant Ave. & Putnam Ave.	Yes	No	---	No	1964
BR-SP-40-S	32226	Service Box	718 Putnam Ave.	---	Yes	No	Yes	---
BR-SP-41-T	VS4035	Transformer Vault	President St. & NY Ave.	No	No	---	No	1964
BR-SP-42-S	31736	Service Box	President St. & NY Ave.	---	No	No	No	---

• No cable in structure

Note:

--- - Not Applicable

Sample BR-SP-9-SS is a street sweep sample and was not included in this table.

Structure Summary Manhattan								
				Lead Cable Present				
CH2M HILL ID Number	Con Edison Structure Number	Type of Structure	Address	Primary	Secondary	Service	Lead Joints Present	Date Transformer Installed
MN-SP-1-S	48878	Service Box	153-155 Wooster St.	---	Yes	Yes	Yes	---
MN-SP-2-S	48881	Service Box	148-150 Wooster St.	---	Yes	Yes	No	---
MN-SP-3-T	5738	Transformer Vault	126 Prince St.	Yes	---	---	No	1963
MN-SP-4-T	9545	Transformer Vault	136 Prince St.	No	No	---	No	1994
MN-SP-5-S	41417	Service Box	283 Mott St.	---	Yes	No	No	---
MN-SP-6-V	4251	Transformer Vault	293 Mott St.	Yes	No	---	Yes	1956
MN-SP-7-V	V 328	Transformer Vault	288 3rd Ave.	No	No	---	No	---
MN-SP-8-S	8793	Service Box	161 E. 22nd St.	---	Yes	No	Yes	---
MN-SP-9-V	V 3844	Transformer Vault	15-17 Willet St.	Yes	No	---	No	---
MN-SP-10-S	51532	Service Box	25 Willet St.	---	Yes	Yes	Yes	---
MN-SP-11-V	V 7138	Transformer Vault	71 Maiden La.	Yes	No	---	No	1960
MN-SP-12-S	51089	Service Box	Maiden & William	---	Yes (Dead)	No	No	---
MN-SP-13-T	5774	Transformer Vault	SE Corner of 30th & Madison Ave.	Yes	No	---	No	1964
MN-SP-14-S	5738	Service Box	27 E. 30th St.	---	Yes	Yes	Yes	---
MN-SP-15-S	44692	Service Box	784-798 7th Ave.	---	Yes	No	Yes	---
MN-SP-16-T	V 5597	Transformer Vault	SW Corner of 52nd & 7th Ave.	Yes	Yes	---	No	1988
MN-SP-17-T	V 8726	Transformer Vault	240 West End Ave.	Yes	No	---	No	1970
MN-SP-18-S	12853	Service Box	278-280 71st St.	---	No	No	No	---
MN-SP-19-T	5822	Transformer Vault	635 Amsterdam Ave.	Yes	No	---	No	1989
MN-SP-20-S	15952	Service Box	148 W. 91st St.	---	No	No	No	---
MN-SP-21-S	17752	Service Box	108 E. 106th St.	---	Yes	No	No	---
MN-SP-22-T	1555	Transformer Vault	101-103 E. 106th St.	Yes	Yes	---	No	1946
MN-SP-23-T	4660	Transformer Vault	700 Lennox St.	Yes	No	---	Yes	1990
MN-SP-24-S	22666	Service Box	114 145th St.	---	No	No	No	---
MN-SP-25-T	6358 M	Transformer Vault	NW Corner of Audobon and W. 178th St.	Yes	No	---	Yes	1991
MN-SP-26-S	23754	Service Box	NW Corner of Audobon and W. 178th St.	---	Yes	---	Yes	---
MN-SP-27-T	V 2698	Transformer Vault	218th & Broadway	Yes	No	---	No	1992
MN-SP-28-S	24288	Service Box	218th & Broadway	---	Yes	No	Yes	---
MN-SP-29-T	VS 2301	Transformer Vault	SE Corner of E. 86th St. & Lexington Ave.	Yes	No	---	Yes	1994
MN-SP-30-S	15263	Service Box	SE Corner of E. 86th St. & Lexington Ave.	---	Yes	No	No	---
MN-SP-31-T	V 9768	Transformer Vault	315 E. 68th St.	Yes	No	---	No	1976
MN-SP-32-S	12513	Service Box	315 E. 68th St.	---	Yes	No	No	---

--- - Not Applicable

Structure Summary The Bronx								
				Lead Present				
CH2M HILL ID Number	Con Edison Structure Number	Type of Structure	Address	Primary	Secondary	Service	Lead Joints Present	Date Transformer Installed
HG-SP-1-S	5977	Service Box	763 E. 132nd St.	---	No	No	No	---
HG-SP-2-T	TM1462	Transformer Vault	747 E. 132nd St.	Yes	No	---	Yes	1986
HG-SP-3-T	V1913	Transformer Vault	Alexander Ave. & E. 143 St.	No	No	---	No	1964
HG-SP-4-S	6846	Service Box	Between 335 & 375 E. 143 St.	---	Yes	Yes	Yes	---
HG-SP-5-T	V4229	Transformer Vault	500 Walton Ave.	No	No	---	No	1985
HG-SP-6-S	22556	Service Box	500 Walton Ave.	---	No	No	No	---
HG-SP-7-T	VS1894	Transformer Vault	E. Bay & Coster	No	No	---	No	1973
HG-SP-8-S	25917	Service Box	347 Coster	---	No	No	No	---
HG-SP-9-T	TM1441	Transformer Vault	Southern Blvd. & Aldus	No	No	---	No	1991
HG-SP-10-S	13196	Service Box	Southern Blvd. across from Aldus	---	Yes	Yes	Yes	---
HG-SP-11-S	20276	Service Box	Mohegan & E. 179th St.	---	No	No	No	---
HG-SP-12-T	TM1008	Transformer Vault	Mohegan & E. 179th St.	No	No	---	No	1989
HG-SP-13-T	VS4143	Transformer Vault	E. 169th & Park	Yes	No	---	No	1975
HG-SP-14-S	20796	Service Box	E. 169th & Park	---	Yes	Yes	Yes	---
HG-SP-15-S	7740	Service Box	160 W. 166th St.	---	Yes	Yes	No	---
HG-SP-16-T	V2556	Transformer Vault	1131-1133 Ogden Ave.	No	No	---	No	1989
HG-SP-17-T	V2484	Transformer Vault	Jerome & E. 184th St.	Yes	No	---	No	1970
HG-SP-18-S	16934	Service Box	2314 Jerome Ave.	---	Yes	Yes	Yes	---
HG-SP-19-T	V3251	Transformer Vault	Olmstead & Randall	No	No	---	No	1991
HG-SP-20-T	V4017	Transformer Vault	Randall & Hollywood	No	Yes	---	Yes	1972
HG-SP-21-S	30976	Service Box	Randall & Logan	---	No	---	No	---
HG-SP-22-S	15534	Service Box	1949 Hobart Ave.	---	No	No	No	---
HG-SP-23-T	V3164	Transformer Vault	Westchester & St. Theresa	No	No	---	No	1974
HG-SP-24-S	29928	Service Box	Adee Ave. & Cruger	---	No	No	No	---
HG-SP-25-T	TM1186	Transformer Vault	Adee Ave. & White Plains	No	No	---	No	1989
HG-SP-26-T	VS1671	Transformer Vault	Carpenter & E. 228 St.	No	No	---	No	1990
HG-SP-27-S	25375	Service Box	Carpenter & E. 228 St.	---	No	No	No	---
HG-SP-28-T	VS2569	Transformer Vault	Baychester & Schieffelin	Yes	No	---	Yes	1971
HG-SP-29-S	24367	Service Box	Schieffelin & Baychester	---	No	No	No	---
HG-SP-30-S	13564	Service Box	Steuben & E. 210	---	Yes	Yes	Yes	---
HG-SP-31-T	TM274	Transformer Vault	Steuben & E. 210	No	No	---	No	1985
HG-SP-32-T	V1865	Transformer Vault	Independence & W. 239	No	No	---	No	1991
HG-SP-33-S	24693	Service Box	3800 Independence	---	No	No	No	---
HG-SP-34-T	VS2274	Transformer Vault	Netherlands & W. 254 St.	Yes	No	---	No	1967
HG-SP-35-S	27582	Service Box	Netherlands & W. 254 St.	---	No	No	No	---

--- - Not Applicable